Zał. nr 4 do ZW 64/2012

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish Wprowadzenie do programowania
Name in English Introduction to programming
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)	30		30		
Number of hours of total student workload (CNPS)					
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					
Number of ECTS points					
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes					

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. The ability to decompose problems in an organized manner.

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SUBJECT OBJECTIVES

C1 Batch programming, redirection, pipelining.
C2 Presentation of structural programming paradigm.
C3 Presentation of the C programming language.
C4 Mastering the usage of programming environment.
C5 Learning to communicate the results of the work.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 Understanding the structural programming paradigm.
PEK_W02 Understands the necessity of problem structuring.
PEK_W03 Learning the C programming language.
PEK_W04 Knows how to express the results of program analysis with language constructs.

relating to skills:
PEK_U01 Learning the basics of shell programming
PEK_U02 Mastering the usage of development tools.
PEK_U03 Practices the recommended principles of problem implementation and program development.

relating to social competences:
PEK_K01 Knows how to concisely and exhaustively communicate the results of her/his word in English.

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Basics of computers and computing, the classification of programming languages.	2
Lec 2	Shell programming, directory structure, redirection, pipelining.	2
Lec 3	A tutorial introduction to the C language.	2
Lec 4	Control flow: Loop and conditional instructions, introduction to variables.	2
Lec 5	Basic data types, variables scope and accessibility rules.	2
Lec 6	Some useful miscellaneous standard functions, recommended programming practices, using the debugger.	2
Lec 7	Operators and expression evaluation.	2
Lec 8	Functions, parameter passing, recursion versus iteration.	2
Lec 9	Proper program structure, getting to know the programming tools: preprocessor, editor, compiler, librarian, profiler	2
Lex 10	Composed data types: arrays and structures,	2
Lec 11	Pointers and typical errors connected with their usage.	2
Lec 12	Heap processing	2
Lec 13	Dynamic structures: queues, lists, trees.	2

Lec 14	File low and high level processing, situational and random access,	2
Lec 15	Final test	2
	Total hours	30

Form of classes - class		Number of hours
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		Number of hours
Lab 1	Introductory class, demonstration of system and programming environment.	2
Lab 2	Using simple standard and non standard filters.	2
Lab 3	Shell programming.	2
Lab 4	Implementation of simple filters.	2
Lab 5	Implementation filters with switches.	2
Lab 6	Creating projects, practicing debugger	2
Lab 7	Using string processing functions.	2
Lab 8	Simple interactive programs: calculators and value converters.	2
Lab 9	Simple interactive programs: text searching.	2
Lab 10	Recursive functions.	2
Lab 11	Developing modules for structures processing.	2
Lab 12	Tbe basics of proper pointer usage.	2
Lab 13	Dynamic memory allocation and dynamic data structures.	2
Lab 14	Practical test basic version	2
Lab 15	Test retake or Practical test advanced version.	2
	Total hours	30

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Lectures with multimedia presentations. N2. Presentation of software presentation tools. N3. E-learning system for publication of primary and supplementary course materials. N4. Laboratory work.

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_W03 PEK_W04	Final test checking students' theoretical knowledge and ability to analyze source code. To pass a student has to get at least 50% of all points.
F2	PEK_W03 PEK_W04 PEK_U01 PEK_U02 PEK_U03 PEK_K01	Solving tasks given by the teacher. The student has to explain the way he/she has solved any task and be able to introduce small changes to the solution in an on-line manner. Solving at least 80% of all task is obligatory.
F3	PEK_U01 PEK_U02 PEK_U03	Final test, the basic version. Developing code of 3 tasks provided by the teacher. Solving 2 of them is necessary to pass.
F4	PEK_U02 PEK_U03	Final test, the advanced version. Developing code of 3 tasks provided by the teacher. Solving 2 of them is necessary to pass. The tasks are considerably more complex than in F3. Passing the test is optional. It is necessary only when a student wants to get the grade 4,5 or above.
P1	All effects	The final grade is composed from the following ingredients: 60% F1 20% F2 10% F3 10% F4 The grades are assigned according to the following principle: <40% 2,0 <=40, 50> 3,0 <=50, 60> 3,5

		<=60, 70> 4,0 <=70, 80> 4,5 <=80, 90> 5,0 <=90, 100>= 5,5
C		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Kernighan B. W., Ritchie D. M.: C Programming Language (2nd Edition), Prentice Hall Software Series
[2] King K.N. - C Programming : A Modern Approach
[3] Gooking D: C for Dummies, Wiley Publishing Inc.

SECONDARY LITERATURE:

[1] Prinz P., Kirch-Prinz U.: C Pocket Reference, O'Reilly
[2] Prinz P., Crawford T.: C in a Nutshell, O'Reilly
[3] Gookin D.: C All-in-One Desk Reference For Dummies, Wiley Publishing Inc.

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

Ph.D. Andrzej Siemiński

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Introduction to Programming

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science.

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 (knowledge)	K1INF_W03, K1INF_W04 K1INF_W10	C2, C3	Lec1-Lec14	N1, N3
PEK_W02	K1INF_W05	C2	Lec 3, Lec 8, Lec 9	N1, N3
PEK_W03	K1INF04	C3	Lec 3, Lec 5, Lec 5, Lec 7	N1, N3
PEK_W04	K1INF_w04	C3, C4	Lec 10, Lec 11, Lec 12, Lec 13, Lec 14	N1, N3
PEK_U01 (skills)	K1INF_U01, K1INF_W05	C1	Lab1-Lab3	N2, N4
PEK_U02	K1INF_U01, K1INF_W05	C4	Lab 6	N2, N4
PEK_U03	K1INF_U01, K1INF_W05	C2, C3	Lab 4-Lab5 Lab7-Lab13	N2, N4
PEK_K01 (competences)	K1INF_K06	C5	Lab1-Lab13	N2, N4

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

*** - from table above

FACULTY COMPUTER SCIENCE AND MANAGEMENT / DEPARTMENT……

SUBJECT CARD

Name in Polish Etyka informatyczna

Name in English Computer Ethics

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 INZ0295s

Group of courses ~~YES~~ / NO*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)					30
Number of hours of total student workload (CNPS)					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					
Number of ECTS points					2
including number of ECTS points for practical (P) classes					2
including number of ECTS points for direct teacher-student contact (BK) classes					1,2

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. None

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SUBJECT OBJECTIVES

C1 To provide practical knowledge for understanding ethical aspects of computer science.

C2 To enhance student's knowledge of the moral methodology and its influence to the computer science technology.

C3 To create practical skills for prepare and present human point of view in fundamental applications and solutions based on computing and information processing.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Student has a basic knowledge to understand ethical aspect of computer science.

PEK_W02 Student is familiar with social aspect of computer science.

PEK_W03 Student knows computer ethics and related codes.

relating to skills:

PEK_U01 Student knows the ethical problems connected to modern software and information systems.

PEK_U02 Student is able to apply ethical rules and codes in computer science profession.

relating to social competences:

PEK_K01Student has competence for solving ethical problems in software engineering.

PEK_K02 Student is able to cooperate in group, preparing presentation, discussion and argues ethical needs in modern computer science

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1		
Lec 2		
Lec 3		
Lec 4		
Lec 5		
….		
	Total hours	

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		**Number of hours**
Lab 1		
Lab 2		
Lab 3		
Lab 4		
Lab 5		
…		
	Total hours	

Form of classes - project		**Number of hours**
Proj 1		

Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem 1	History and foundations of information and computer ethics.	2
Sem 2	Moral methodology and theories of ethics.	2
Sem 3	Personal and informational privacy. Anonymity. Online anonymity controversies.	2
Sem 4	Ethical issues of hacking, hacktivism and counterhacking.	2
Sem 5	Health and genetics information. Science and private point of view. Anonymisation od personal data. Ethical and law problems of e-health. Ethics of online health maintenance.	2
Sem 6	Business and ethics. Online trade. High frequency trade. Algorithmic trade. Ethical issues of e-banking.	2
Sem 7	Internet and research. Collecting data, data mining. Geolocalisation.	2
Sem 8	Ethics of information and cyber conflicts.	2
Sem 9	Code of computer science and software engineering ethics.	2
Sem 10	Software and licenses. Digital and online advertisement ethics.	2
Sem 11	Software engineering and ethics. Ethical risk.	2
Sem 12	Information overload and virtual reality. Responsibilities for information content.	2
Sem 13	Intellectual property. Legal and moral problems. Regulations and governance of digital content. Censorship of information resources and information access.	2
Sem 14	Perspectives for information and computer ethics.	2
Sem 15	Final test.	2
	Total hours	30

TEACHING TOOLS USED

N1. Multimedia presentations
N2. The course Web page
N3. Electronics and paper books, library references

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F –	Educational effect number	Way of evaluating educational effect achievement

forming (during semester), P – concluding (at semester end)		
F1	PEK_U01-PEK_K02	Evaluation of presentation, discussion and activity
F2	PEK_U01-PEK_K02	Short tests
F3	PEK_W01-PEK_K02	Final test
C	F1 + F2 + F3	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Johnson D. G.: Computer ethics. Pearson 2009.
[2] Himma K. E., Tavani H. T.: The Handbook of Information and Computer Ethics. John Wiley & Sons. New Jersey 2008.
[3] Tavani H.: Ethics and Technology: Controversies, Questions, and Strategies for Ethical Computing. John Wiley & Sons. New Jersey 2011.
[4] Spinello R.: Cybernetics: Morality and Law in Cyberspace. John & Bartlett Learning, LLC. Sundbury 2011.

SECONDARY LITERATURE:

[1] Cahn S.: Ethics: History, Theory and Contemporary Issues. Oxford University Press 2011.
[2] Thiroux J. P.: Ethics: Theory and Practice. Prentice Hall 2008.

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……

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 (knowledge)	K1INF_W20	C1	Sem1, Sem 2	N1, N2, N3
PEK_W02	K1INF_W20	C2, C3	Sem1- Sem14	N1, N2, N3
PEK_W03	K1INF_W20	C2, C3	Sem1- Sem14	N1, N2, N3
PEK_U01 (skills)	K1INF_U11, K1INF_U12	C1, C2	Sem1- Sem14	N1, N2, N3
PEK_U02	K1INF_U11, K1INF_U12	C1, C2	Sem1- Sem14	N1, N2, N3
PEK_K01 (competences)	K1INF_K03	C1, C3	Sem1- Sem14	N1, N2, N3
PEK_K02	K1INF_K05	C1, C2, C3	Sem1- Sem14	N1, N2, N3

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

*** - from table above

FACULTY of Computer Science and Management / DEPARTMENT……

SUBJECT CARD

Name in Polish Problemy etyczne informatyki

Name in English Ethical Problems in Computer Science

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 INZ000296

Group of courses YES / ~~NO~~*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15				15
Number of hours of total student workload (CNPS)	30				30
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				2
including number of ECTS points for practical (P) classes	1				1
including number of ECTS points for direct teacher-student contact (BK) classes	1,2				1,2

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. None

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SUBJECT OBJECTIVES

C1 To provide knowledge of ethics related to computer science profession. To provide knowledge and skills of using and applying codes of computer ethics.

C2 To provide practical knowledge of digital goods and ethical aspects of designing, manufacturing, distributing and using them.

C3 To enhance student's knowledge of the moral methodology and its influence to software engineering.

C4 To create practical skills for prepare and present current ethical topics.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Student has a basic knowledge to identify and solve ethical problems in computer science.

PEK_W02 Student is familiar with theory of computer ethics and social aspect of computer science profession.

PEK_W03 Student knows main computer related ethical problems in software engineering and digital information processing.

relating to skills:

PEK_U01 Student is able to solve ethical problems related to computer science and information technology.

PEK_U02 Student knows the ethical rules and has possibility to apply them in computer science practice .

relating to social competences:

PEK_K01Student has competence for applying ethical rules to cooperate and professional work.

PEK_K02 Student is able to cooperate in group, preparing presentation, discussion and argues ethical needs in modern computer and information systems

PROGRAMME CONTENT

Form of classes - lecture		**Number of**
Lec 1	The ethics and the social meaning of the computer scientist occupation. Ethical codes and codes of practice. Foundations of ethics.	2
Lec 2	Information goods. The software and hardware products in the social context.	2
Lec 3	Ethical issues of computer science profession. Code of computer ethics.	2
Lec 4	Ethics use of computer programs and databases. Computer and software engineering. Examples of information and computer science social, ethical and law problems.	2
Lec 5	Digital content. The law and ethics problems.	2
Lec 6	What is license. Free, limited, proprietary and other licenses. Licenses and ethics.	2
Lec 7	Ethical problems related to security. Personal, data, software, systems.	2
Lec 8	Final test.	1
	Total hours	15

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		**Number of hours**
Lab 1		

Lab 2		
Lab 3		
Lab 4		
Lab 5		
…		
	Total hours	

Form of classes - project		**Number of hours**
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem 1	Foundation of ethics and computer ethics.	3
Sem 2	Digital content and ethical problems.	3
Sem 3	Codes of ethics. Codes of computer ethics	3
Sem 4	Computer software. Licenses and ethics	3
Sem 5	Health information, personal information, cybercrimes and ethics	2
Sem 6	Final test	1
	Total hours	15

TEACHING TOOLS USED

N1. Multimedia presentations
N2. The course Web page
N3. Electronics and paper books, library references

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_U01-PEK_K02	Evaluation of presentation, discussion and activity. Short tests
F2	PEK_W01-PEK_K02	Final test
C	F1 + F2	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Himma K. E., Tavani H. T.: The Handbook of Information and Computer Ethics. John Wiley & Sons. New Jersey 2008.
[2] Tavani H.: Ethics and Technology: Controversies, Questions, and Strategies for Ethical Computing. John Wiley & Sons. New Jersey 2011.
[3] Spinello R.: Cybernetics: Morality and Law in Cyberspace. John & Bartlett Learning, LLC. Sundbury 2011.

SECONDARY LITERATURE:

[1] Cahn S.: Ethics: History, Theory and Contemporary Issues. Oxford University Press 2011.
[2] Thiroux J. P.: Ethics: Theory and Practice. Prentice Hall 2008.
[3] Kaczmarczyk L. C.: Computers and society: Computing for Good. Chapman & Hall CRC Press 2011.

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……

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 (knowledge)	K1INF_W20	C1, C4	Lect1 – Lect7	N1, N2, N3
PEK_W02	K1INF_W20	C2, C3	Lect1 – Lect7	N1, N2, N3
PEK_W03	K1INF_W20	C2, C3	Lect1 – Lect7	N1, N2, N3
PEK_U01 (skills)	K1INF_U11, K1INF_U12	C1, C2, C4	Lect1 – Lect7 Sem1- Sem6	N1, N2, N3
PEK_U02	K1INF_U11, K1INF_U12	C1, C2,C4	Lect1 – Lect7 Sem1- Sem6	N1, N2, N3
PEK_K01 (competences)	K1INF_K03	C1, C2, C3	Lect1 – Lect7 Sem1- Sem6	N1, N2, N3
PEK_K02	K1INF_K05	C1, C2, C3, C4	Lect1 – Lect7 Sem1- Sem6	N1, N2, N3

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

*** - from table above

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish …Podstawy Elektroniki i Miernictwa…….
Name in English…Electronics and Metrology – basic principles
Main field of study (if applicable): Computer Science
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)	30	15	30		
Number of hours of total student workload (CNPS)	150		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	X			
Number of ECTS points	5		2		
including number of ECTS points for practical (P) classes			1		
including number of ECTS points for direct teacher-student contact (BK) classes	3		1,2		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of the Mathematical Analysis and Physics

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SUBJECT OBJECTIVES

C1 Introducing the students to the principles of the work of semiconductor devices
C2 Take possession of the basic knowledge about the physical properties of the semiconductor materials, band theory of the materials and main properties of the bipolar and unipolar devices.
C3 Presentation of the principles of the measurements of electrical quantities and the basics of the electronic circuits and optoelectronics.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 ma podstawową wiedzę związaną z prawami rządzącymi przepływem prądu elektrycznego w obwodzie elektrycznym

PEK_W02 zna budowę, zasadę działania i podstawowe zastosowania przyrządów półprzewodnikowych takich jak np. dioda, tranzystory bipolarne i unipolarne

PEK_W03 ma podstawową wiedzę z zakresu miernictwa elektrycznego

relating to skills:

PEK_U01 potrafi analizować i projektować proste, liniowe układy elektryczne

PEK_U02 potrafi analizować i projektować układ elektryczny z elementami nieliniowymi

PEK_U03 potrafi zaprojektować stabilizator oparty na diodzie Zenera

…

relating to social competences:

PEK_K01 potrafi wyszukiwać i korzystać z literatury zalecanej do kursu

PEK_K02 rozumie konieczność systematycznej pracy w celu opanowania materiału kursu

PEK_K03 identyfikuje zastosowania elektroniki w różnych dziedzinach życia

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	*The circuit of the direct current. RLC circuits*	*2*
Lec 2	*The basics of the electronics measurements*	*2*
Lec 3	*Physical basics of the semiconductor materials*	*2*
Lec 4	*P-n junction principle of the operation, and it properties*	*2*
Lec 5	*Semiconductor's diodes and their applications in electronic circuits*	*2*
Lec 6	*Bipolar transistors, principles of the operation, characteristics, applications in electronic circuits*	*2*
Lec 7	*Field Effect Transistors, principles of the operation and applications in electronic circuits*	*2*
Lec 8	*. Integrated circuits, methods of the realization of semiconductor devices*	*2*
Lec 9	*Logic gates and inverters*	*2*
Lec 10	*Semiconductor memories*	*2*
Lec 11	*Non semiconductor memories*	*2*

Lec 12	*D/A and A/D converters*	*2*
Lec 13	*Linear integrated circuits*	*2*
Lec 14	*Optoelectronic*	*2*
Lec 15	*Colloquy*	*2*
	Total hours	*30*

Form of classes - class		**Number of hours**
Cl 1	*Organization time*	1
Cl 2	*Connections of the electronics elements, Kirchoff's, Norton's and Ohm's laws*	2
Cl 3	*Analysis of the circuits with nonlinear elements*	2
Cl 4	*Zener's diode as a voltage stabilizer*	2
Cl 5	*Charging and discharging capacitor*	2
Cl 6	*Voltage divider, RLC circuits*	2
Cl 7	*Resonanse circuits*	2
Cl 8	*Colloquy*	2
	Total hours	15

Form of classes - laboratory		**Number of hours**
Lab 1	*Organization time*	2
Lab 2	*Operation of the measurement instruments, basics of the measurement of the current and voltage*	2
Lab 3	*I=f(U) characteristic of the p-n junction*	2
Lab 4	*Zener's diode, project of the stabilizer*	2
Lab 5	*The measurement of the power consumption of the TTL and CMOS gates*	2
Lab 6	*Static characteristics of the TTL logical gates*	2
Lab 7	*Transoptors*	2
Lab 8	*Static characteristics of the bipolar transistors*	2
Lab 9	*Static characteristics of the unipolar transistors*	2
Lab 10	*Dynamic characteristics of the TTL and CMOS logical*	2
Lab 11	*Frequency limitations of the bipolar transistors*	2
Lab 12	*Switching operation of the bipolar transistor*	2
Lab 13	*Using oscilloscope to the measurement characteristics of the electronic elements*	2
Lab 14	*Additional laboratory*	2
Lab 15	*Additional laboratory*	2
	Total hours	30

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lecture – use of multimedia

N2. Laboratory – traditional method

N3. Consultations

N4. Work of personal student

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 Laboratory	PEK_U01, PEK_U02, PEK_U03, PEK_K01	reports
F2 Classes	PEK_U01-PEK_U03	tests
P1 Lecture	PEK_W01, PEK_W02, PEK_W03, PEK_K02, PEK_K03	Final colloquy at the end of the semester

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] [1] A. Zatorski, Podstawy miernictwa elektrycznego, Kraków AGH, 2011
[2] J. Hennel, Podstawy elektroniki półprzewodnikowej, Warszawa, Wydawnictwo NT 2003

SECONDARY LITERATURE:

[1] [1] A.Świt, J. Pułtorak, Przyrządy Półprzewodnikowe, Warszawa, WTN 1979
[2] S. Lebson, Podstawy miernictwa elektrycznego, WNT, 1972

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

dr hab. inż. Janusz Martan prof. PWr, janusz.martan@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Electronics and Metrology – basic principles……

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science

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 (knowledge)	K1INF-W08	C1	Lec 1	1,3,4
PEK_W02	K1INF-W08	C2, C4	Lec 3-Lec 13	1,3,4
PEK_W03	K1INF-W08	C3	Lec2	1,3,4
…				
PEK_U01 (skills)	K1INF-W07, K1NF-U-14	C2, C3	L2, L3	2,3,4
PEK_U02	K1INF-W07, K1NF-U14	C2-C4	L4, L6-L12	2,3,4
PEK_U03	K1INF-W07, K1INF-U14	C2, C3	L4, L5	2,3,4
PEK_K01 (competences)	K1INF_K01 K1INF_K02 K1INF_K03	C1-C4	lec1-Lec14 L2-L13	1-4
PEK_K02	K1INF_K01 K1INF_K02 K1INF_K03	C1-C4	Lec1-Lec14 L2-L13	1-4
PEK_K03	K1INF_K01 K1INF_K02 K1INF_K03	C1-C4	Lec1-Lec14 L2-L13	1-4

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

*** - from table above

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FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish: Struktury danych i algorytmy.
Name in English: Data Structures and Algorithms.
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)	30	15	30		
Number of hours of total student workload (CNPS)	60	30	90		
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	3		
including number of ECTS points for practical (P) classes	0	0	3		
including number of ECTS points for direct teacher-student contact (BK) classes	1,4	0,7	1,5		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Programming skill in C/C++ language.
2. Ability to prepare the development environment for building applications in C/C++.

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SUBJECT OBJECTIVES

C1 Providing knowledge on basic data structures, including dynamic structures and classic algorithms and algorithmic problem-solving techniques.
C2 Ability to implement data structures, implementation of selected algorithms and the ability to use algorithmic problem-solving techniques.
C3 Awareness of proper behavior in the computer lab.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Knowledge about structures and operation complexity of basic linear structures, trees, heaps and graphs.

PEK_W02 Knowledge about chosen algorithms and its complexity.

Relating to skills:

PEK_U01 Ability to implement selected data structures

PEK_U02 Ability to implement selected algorithms.

PEK_U03 Awareness of a proper behavior in a computer lab.

PROGRAMME CONTENT

Form of classes – lecture		**Number of hours**
Lec 1	Fundamental principles algorithms analysis: correctness, computational complexity (worse-case, expected), amortized analysis (potential method).	2
Lec 2	Basic structures: stack, queue, list.	4
Lec 3	Design of efficient algorithms: divide-and-conquer, dynamic programming, greedy algorithms.	2
Lec 4	Sorting: sorting by comparisons (insertionSort, quickSort, mergeSort), basic priority queue, heapSort, radix sort, sorting complexity.	4
Lec 5	Selection: Hoare's algorithm, Median of Medians algorithm	2
Lec 6	Searching and simple directories: linear and binary searching, binary search tree, hashing.	3
Lec 7	Effective dictionaries: AVL tree, red-black tree, B-tree.	3
Lec 8	Advanced data structures: binomial heaps, Fibonacci heaps, data structures for disjoint sets.	3
Lec 9	Graph algorithms: search (breadth-first , depth-first), minimum spanning tree, single source shortest paths, all pairs shortest paths.	3
Lec 10	String matching: naive, Rabin-Karp algorithm, with finite automaton, Knuth-Moris-Pratt algorithm.	2
Lec 11	NP-completeness: P and NP classes, NP-hard and NP-complete problems	2
	Total hours	30

Form of classes – class		**Number of hours**
Cl 1	Solving simple problems dividing it into smaller subproblems	2
Cl 2	Implementation of selected operations on choosen type of linked list	2
Cl 3	Solving selected problems with use of divide-and-conquer, dynamic programming, greedy algorithms.	2
Cl 4	Analyze of selected sorting algorithms.	2
Cl 5	Analyze of unbalanced and balanced binary search trees	3
Cl 6	Analyze of operation of disjoin set forest.	1
Cl 7	Analyze of algorithms from graph theory	3
	Total hours	15

Form of classes – laboratory		Number of hours
Lab 1	Instruction about a laboratory, introduction to programming environments.	2
Lab 2	Solving simple problems dividing it into smaller subproblems	2
Lab 3	Implementation of stack and queue	2
Lab 4	Implementation of one-way linked list	2
Lab 5	Implementation of two-way linked list	2
Lab 6	Implementation algorithm with use of divide-and-conquer, dynamic programming, greedy algorithms.	4
Lab 7	Implementation and comparison of sorting algorithms	4
Lab 8	Implementation and research of binary search tree.	4
Lab 9	Practical comparison of complexity of BST and hashtable	2
Lab 10	Implementation and use of disjoin-set forest	2
Lab 11	Implementation of graphs representation in memory	2
Lab 12	Implementation selected algorithms from graph theory.	2
	Total hours	30

Form of classes – project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes – seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Lecture N2. The course web page with references to literature and course related stuff. N3. Exercises. N4. Software infrastructure for programmers.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), E – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1	K1INF_U14	Appropriate behavior of the students in the lab. (Lab1-Lab15)

F2	K1INF_U01	Solving and presenting solutions to programming tasks using a variety of data structures (Lab2-Lab15). Implementation of a list of 11 tasks, each list is worth 10 points. A total of 110 points can be obtained.
E1	K1INF_U01	Points gained in the laboratory represent 30% of the final mark, but the condition of taking a part in the exam is to obtain a minimum of 44 points from the lab.
E2	K1INF_W04 K1INF_U01	Points gained during the exercise represent 30% of the final, but only count as an additional component of the assessment E3.
E3	K1INF_W04	The exam consists of about 20 different types of tasks and the degree of difficulty, which is 70% of the final assessment.
E		E=E1+MIN(70, E2+E3) Final evaluation: • 5.5 – <95%; 100%> • 5.0 – <90%; 95%) • 4.5 – <80%; 90%) • 4.0 – <70%; 80%) • 3.5 – <60%; 70%) • 3.0 – <50%; 60%) • 2.0 – <0%; 50%)

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, "Introduction in algorithms". The MIT Press; 2 edition (September 1, 2001), 1184 pages,
[2] Kenneth A. Berman, Jerome L. Paul, "Algorithms: Sequential, Parallel, and Distributed", Course Technology; 1 edition (October 11, 2004), 992 pages.

SECONDARY LITERATURE:

[1] Harel D., Algorithmics. The Spirit of Computing, Addison Wesley, 2004.
[2] Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, Data Structures and Algorithms, Addison-Wesley, 1983.

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……

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	**K1INF_W04**	C1	Lec1-2,4,6-9,11 Cl2,5,6	N1-3
PEK_W01	**K1INF_W04**	C1	Lec1,3-4,9-11 Cl1,3,4,7	N1-3
PEK_U01	**K1INF_U01**	C2	Lab3-5,8,10,11 Cl2,5,6	N2-4
PEK_U02	**K1INF_U01**	C2	Lab2,6-7,12 Cl1,3,4,7	N2-4
PEK_U03	**K1INF_U14**	C3	Lab1	N3

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish **Bazy danych**
Name in English **Databases**
Main field of study (if applicable): Computer Science
Specialization (if applicable): ……..
Level and form of studies: 1st/ ~~2nd~~* level, full-time ~~/ part-time~~*
Kind of subject: obligatory / ~~optional~~ / ~~university-wide~~*
Subject code **INZ0259Wcl**
Group of courses YES / ~~NO~~*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	15	15		
Number of hours of total student workload (CNPS)	30	30	90		
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	1	1	3		
including number of ECTS points for practical (P) classes	0	0	1		
including number of ECTS points for direct teacher-student contact (BK) classes	0,6	0,6	1,8		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. General IT knowledge
2. Computer skills

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SUBJECT OBJECTIVES

C1 Gaining the basic knowledge about databases, data models and their implementation in a DBMS
C2 Acquisition of the ability to define and process data stored in databases

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 Describes the principles of data modeling at different levels of abstraction -> W07
PEK_W02 Presents basic transformation rules of data models and their verification -> W07
PEK_W03 Describes implementation rules of data models in a DBMS -> W07
PEK_W04 Presents the role and possibilities of using the SQL standard in a DBMS systems -> W16
PEK_W05 Defines the rules for defining architecture of database systems -> W22

relating to skills:
PEK_U01 Defines a conceptual data model using the UML -> U04
PEK_U02 Transforms conceptual data model into a physical model, taking into account the business rules and domain constraints -> U09
PEK_U03 Removes anomalies of data using the normalization process -> U09
PEK_U04 Defines queries using DML database languages and their implementation in a DBMS for searching and processing of data in databases -> U04, U19
PEK_U05 Knows and applies safety rules of working -> U14

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction - General Course Information – Concepts and Architecture	2
Lec 2	Data modeling at different levels of abstractions - aims, properties, languages of specifications	2
Lec 3	The Relational Data Model – definition, properties, constraints	2
Lec 4	The Relational Algebra	2
Lec 5	Functional Dependencies - Normal Forms - Normalization Process	2
Lec 6	Normalization Process cont.	2
Lec 7	Introduction to Data Definition Language (DDL)	2
Lec 8	Implementation of conceptual data models using the SQL standard DDL - basic information	2
Lec 9	DDL – Implementation of constraints	2
Lec 10	Introduction to Data Manipulation Language (DML), Transactions	2
Lec 11	DML - Data Modification (INSERT, UPDATE, DELETE)	2
Lec 12	DML Query - Joins, Subquery, Set Operations, Views	2
Lec 13	DML - Common Table Expressions, Stored Procedure, Triggers	2
Lec 14	NoSQL Databases	2
Lec 15	Test	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1	Introduction – Data - Data Models - DBMS	2
Cl 2	Data modeling – UML/ERD- (P01)	2
Cl 3	Examples of simple databases, Basic rules of transformation of data models	2
Cl 4	The Relational Algebra Operations - (P02)	2
Cl 5	Normalization process – 1NF, 2NF, 3NF - (P03)	2
Cl 6	Normalization process – BCNF, 4NF - (P03)	2
Cl 7	Transactions – Concurrency Control Technics - (P04)	2
Cl 8	Test	1
	Total hours	15

Form of classes - laboratory	**Number of hours**

Lab 1	Health and safety training. Conditions of the course. Organization of work, Introduction to DBMS (P08)	2
Lab 2	Analysis of exemplary databases	2
Lab 3	DDL – creating simple database –"Our University" (Student, Course, Teacher, etc.) – (P05)	2
Lab 4	DML - INSERT, UPDATE, DELETE – (P06)	2
Lab 5	DML Query - Joins, Subquery, Set Operations, Views (P06)	2
Lab 6	DML - Common Table Expressions (P06)	2
Lab 7	Programming - Stored Procedure, Triggers, User Defined Functions (UDF) – (P07)	2
Lab 8	Test	1
	Total hours	15

Form of classes - project		**Number of hours**
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lecture informative with elements of problem domains, supported by multimedia presentations and examples of solutions
N2. Database management systems
N3. E-learning system used for the publication of teaching materials and messages, and evaluate student work

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 – P01	PEK_U01	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F2 – P02	PEK_U01	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F3 – P03	PEK_U02 PEK_U03	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}

F4 – P04	PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F5 – P05	PEK_U03 PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F6 – P06	PEK_U03 PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F7 – P07	PEK_U03 PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F7 – P08	PEK_U05	Acceptable behavior in a lab.

C

Test of students' knowledge and skills of the discussed topics on the lectures. Evaluation of the abilities of solving the problems defined in the context of databases.

On the positive evaluation:

- The student should gain average grade from classes and lab. at least **3.0** on the base of the following formula:

  p. < 8,0 -> 2.0
  8,0 ≤ p. < 9,5 -> 3.0
  9,5 ≤ p. < 11 -> 3.5
  11 ≤ p. < 12 -> 4.0
  12 ≤ p. < 13 -> 4.5
  13 ≤ p. ≤ 14 -> 5.0
- On the final test the student must solve at least 3 of the 5 tasks, and answer 2 out of 5 questions.

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Connolly T., Begg C., Database Systems. A Practical Approach to Design, Implementation, and Management 4th ed., Addison Wesley, 2005
[2] Celko J., SQL for Smarties. Advanced SQL Programming, 3th ed., Elsevier, 2005
[3] Elmasri R., Navathe S., Fundamentals of Database Systems 5th ed., Addison Wesley, 2007
[4]Kifer M., Bernstein A., Lewis P., Database Systems. An Application-Oriented Approach 2nd ed., Addison Wesley, 2006

SECONDARY LITERATURE:

[1] Ben-Gan I., Microsoft SQL Server 2008, T-SQL Fundamentals, Microsoft Press, 2009
[2] The educational materials prepared by the teacher course on the basis of the documentation MS SQL, Oracle, and Internet resources

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Databases

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science

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	K1INF_W07	C1	Lec 2, 3, 4, 5, 6, Cl 2, 4, 5, 6	N1, N3
PEK_W02	K1INF_W07	C1	Lec 2, 5, 6, 9 Cl 3	N1, N3
PEK_W03	K1INF_W07	C1	Lec 4, 8 Cl 5, 6	N1, N3
PEK_W04	K1INF_W016	C2	Lec 7, 8, 9, 10, 11, 12, 13 Cl 4	N1, N3
PEK_W05	K1INF_W022	C1	Lec 1, 14	N1, N3
PEK_U01 (skills)	K1INF_U04	C1	Cl 2, 3 Lab 2, 3	N1, N2, N3
PEK_U02	K1INF_U09, K1INF_U19	C1, C2	Lab 3	N1, N2, N3
PEK_U03	K1INF_U09	C1	Cl 5, 6 Lab 3	N1, N2, N3
PEK_U04	K1INF_U04, K1INF_U19	C2	Lab 4, 5, 6, 7	N1, N2, N3
PEK_U05	K1INF_U14	C1	Lab 1..8	
…				
PEK_K01 (competences)				
PEK_K02				
…				

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

*** - from table above

FACULTY OF COMPUTER SCIENCE AND MANAGEMENT

SUBJECT CARD

Name in Polish: Teoria informacji i sygnałów

Name in English: Theory of information and signals

Main field of study (if applicable): Computer Science

Specialization (if applicable): ……..

Level and form of studies: 1st level, full-time

Kind of subject: obligatory

Subject code …….

Group of courses: NO

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

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Have a basic knowledge from linear algebra, analytic geometry and mathematical analysis necessary to solve simple engineering oriented calculation tasks in technical and nontechnical applications (K1INF_W01)
2. Have a basic knowledge from discrete mathematics, mathematical logic and mathematical statistics necessary to formulate and solve simple engineering problems (K1INF_W02)
3. Have a basic knowledge in area of mechanics and waves theory (K1INF_W03)
4. Can use indicated an analytical method and plan and carry out a simple experiment and computer simulation engineering, conduct a survey and analyze the results, particularly for the selected system components (K1INF_U09)
5. Understands and knows the need continuous training opportunities and improving their

social skills (K1INF_K01)

SUBJECT OBJECTIVES

C1. Ordered, underpinned by theoretical knowledge of information systems and processes, the use of statistical information theory, optimal coding of continuous and discrete channels and information without interference, methods and techniques to transmit signals using different modulation techniques supporting continuous and discrete signals, continuous and discrete signals and information prevention of errors arising in the results of interference in the transmission channels.

C2. Skills for determining the characteristics of analog and discrete signals (frequency spectrum, frequency, power distribution), the advantages and disadvantages of various methods of modulation signals, continuous and discrete signals and adjust transmission channels, modulation methods for comparing continuous and discrete signals, the range of applications of particular methods of modulation, basis of the hierarchy of analog and digital signals and selection methods to prevent errors in transmission systems.

C3. Skills for the selection of appropriate modulation methods of communication tasks in analog and digital systems.

SUBJECT EDUCATIONAL EFFECTS

Relating to knowledge:
K1INF_W11: Has a basic knowledge of IT systems and computer networks
K1INF_W16: Knows the basic methods and tools for collecting, processing and retrieval of information and knowledge extraction

Relating to skills:
K1INF_U05: Has the ability to self-education, including in order to improve the professional competence
K1INF_U15: Can using the right tools to build a simple model of the process (the object), to formulate a specific task analysis and decision making
K1INF_U16: Able to effectively use the methods and tools for the collection, processing and retrieval of information and knowledge extraction

Relating to social competences:
K1INF_K01: He understands and knows the need continuous training opportunities and improving their social skills and
K1INF_K03: Able to interact and work in a group, taking in the different roles

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Information systems - basic concepts	2
Lec 2	Theories of information. Statistical information theory. Entropy as a measure of the amount of information in the statistical theory of	2

	information.	
Lec 3	Information processes and transmission of information. Transmission channel model.	2
Lec 4	Optimal encoding in discrete channel without interferences	2
Lec 5	Optimal encoding in discrete channel with interferences	2
Lec 6	Optimal encoding in continuous transmission channel without and with interferences	2
Lec 7	Representation of signals and systems - Fourier transform	2
Lec 8	Fourier transform - properties	2
Lec 9	Continuous amplitude modulation	2
Lec 10	Continuous angle modulation	2
Lec 11	Keying of amplitude, frequency and phase	2
Lec 12	Pulse code modulation	2
Lec 13	Transmission encoding	2
Lec 14	Preventing errors - correction codes	2
Lec 15	Preventing errors – automatic retransmission request	2
	Total hours	**30**

PROGRAMME CONTENT		
Form of classes - class		**Number of hours**
Cl 1	Fourier transform and Fourier series expansion	2
Cl 2	Orthogonality - collections of orthogonal signals. Even and odd functions.	2
Cl 3	The Fourier transform of periodic and aperiodic signals. Even and odd harmonics. Convergence of Fourier series.	2
Cl 4	Fourier series - amplitude, trigonometric and exponential forms	2
Cl 5	Calculation of Fourier series coefficients in amplitude, trigonometric and exponential forms.	2
Cl 6	Fourier series - linear, timeline stretching and shift of signals in the time domain	2
Cl 7	Fourier series - a shift of signals in the frequency domain.	2
Cl 8	Fourier series - differentiation and integration of signals in the time domain.	2
Cl 9	Fourier series - coupled functions, multiplication in the time domain and time-domain convolution. Discrete frequency spectra.	2
Cl 10	Rayleigh energy theorem. The multiplication and Parseval’s theorems. Power spectrum.	2
Cl 11	The inverse proportionality of the time and frequency - the interchangeability of the products of bandwidth and time	2
Cl 12	The Dirac delta function, step function and sampling function	2

Cl 13	Applications of Dirac delta and step functions	2
Cl 14	Transmission of signals through linear systems	2
Cl 15	Fast Fourier Transform algorithms	2
	Total hours	**30**

TEACHING TOOLS USED
N1. Traditional lecture. Multimedia presentations.
N2. Student's own works – solving calculation tasks.
N3. N4. Student's own works – literature studies.
N5. Collective works during classes.
N5. Student's own works – oral presentations.

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 (lecture)	K1INF_W11 K1INF_W16 K1INF_U05 K1INF_U15 K1INF_U16 K1INF_K01 K1INF_K03	Observation of student's activity. Solving exercises. Preparation and presentation delivery.
F1 – F15 (class)	K1INF_W11 K1INF_W16 K1INF_U05 K1INF_U15 K1INF_U16 K1INF_K03	Checking the preparation of the student. Checking the presence of the student. Observation of student activity. Observation and evaluation of student independence. Analysis of reports of exercise.
P (lecture)	K1INF_W11 K1INF_W16 K1INF_U05 K1INF_U15 K1INF_U16 K1INF_K01 K1INF_K03	Examination taking into account results of forming evaluation F1 (lecture)
P (class)	K1INF_W11 K1INF_W16 K1INF_U05 K1INF_U15	Weighted sum of forming evaluations F1 – F15 (classes).

	K1INF_U16 K1INF_K03	

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE: [1] G. Pujolle, D. Seret, D. Dromard, E. Horlait, „Integrated Digital Communication Networks", J. Wiley & Sons [2] S. Haykin, „Communication systems", J. Wiley & Sons [3] M. Roden, „Analog and digital communication systems", Prentice Hall SECONDARY LITERATURE: [1] MIT open cources:http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/ [2] http://www.freebookcentre.net/Networking/Free-Computer-Networking-Books-Download.html

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Information and signals theory

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***	Program content***	Teaching tool number***
PEK_W01 (knowledge)	K1INF_W11	C1, C2, C3	Lec 1 – Lec 15	N1, N2, N3
PEK_W02	K1INF_W16	C1, C2, C3	Lec 1 – Lec 15	N1, N2, N3
PEK_U01 (skills)	K1INF_U05	C2, C3	Lec 1 – Lec 15 Cl 1 – Cl 15	N1, N2, N4
PEK_U02	K1INF_U15	C2, C3	Lec 1 – Lec Cl 1 – Cl 15	N1, N2, N4, N5
PEK_U03	K1INF_U16	C2, C3	Lec 1 – Lec Cl 1 – Cl 15	N1, N2, N3, N4
PEK_K01 (competences)	K1INF_K01	C1, C2, C3	Cl 1 – Cl 15	N4, N5
PEK_K02	K1INF_K03	C1, C2, C3	Lec 1 – Lec Cl 1 – Cl 15	N1, N2, N3, N4

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

FACULTY W-8/ DEPARTMENT……

SUBJECT CARD

Name in Polish Rachunek prawdopodobieństwa i statystyka matematyczna
Name in English Theory of probabilistic and statistics
Main field of study (if applicable): Information and Computer Science
Specialization (if applicable): ……..
Level and form of studies: 1st/ ~~2nd~~* level, full-time / ~~part-time~~*
Kind of subject: obligatory / ~~optional~~ / ~~university-wide~~*
Subject code MAZ002519W, MAZ002519C
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	90			
Form of crediting	Examination	crediting with grade			
For group of courses mark (X) final course					
Number of ECTS points	3	3			
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes	1,8	1,8			

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Passed the subject: Algebra and Analytic Geometry. Knowledge of the subject.
2. Passed the subject: Mathematical analysis. Knowledge of the subject.
3. Passed the subject: Discrete Mathematics. Knowledge of the subject.

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SUBJECT OBJECTIVES

C1 Acquisition of basic knowledge of probability and increased knowledge of selected aspects of the theory of probability.
C2 Acquisition of basic knowledge of the reliability of systems.
C3 Acquisition of basic knowledge of mathematical statistics.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 - has knowledge of the nature and properties of probability and probability space, and has knowledge of calculating probability and conditional probability events.
PEK_W02 - know the total probability theorem events and Bayesian model and also has knowledge of the reliability of circuits.
PEK_W03 - has knowledge of random variables, the distribution of the probability distribution function of a random variable, has a knowledge of the basic parameters of random variable and their interpretations.
PEK_W04 - knows limit theorems and their interpretation, and knows the probability inequalities, and knows how to pre-analyze the data for the analysis of probabilistic.

PEK_W05 - knows the point estimate and the maximum likelihood estimators.
PEK_W06 - has knowledge of confidence intervals for the mean and variance of the normal distribution and the ratio, it also has the knowledge of statistical hypothesis testing, tests for the mean and variance for a normal distribution and proportion.
PEK_W07 - known compatibility tests and independence tests, chi-square test, gained knowledgeof analysis of variance and one-dimensional linear regression.

relating to skills:
PEK_U01 - can calculate the overlap of events, conditional probability and the probability of overlap completely overlapping events.
PEK_U02 - can calculate the reliability of connections.
PEK_U03 - is able to calculate the distribution and the cumulative distribution of a random variable, and the basic parameters of random variables.
PEK_U04 - can use estimation and processes greatest reliability estimates, test hypotheses about the mean and variance of the normal distribution, as well as be a one-dimensional linear regression.

relating to social competences:
PEK_K01 - understands the importance of the theory of probability and statistics in the processes of social, economic, and technology.

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	The essence of a random experience. The definition and the properties of probability. Calculation of the probability of the event. The definition of the probability space.	2
Lec 2	Conditional probability. Definition and examples.	2
Lec 3	Bayesian formula. Total probability theorem events.	2
Lec 4	Independence of events. Reliability of connections.	2
Lec 5	Random variable. Probability distribution. The distribution of the random variable. Formal definitions and examples.	2
Lec 6	Basic parameters of random variable. Interpretation of parameters.	2
Lec 7	Limit theorems and their interpretation. Important inequalities of probability.	2
Lec 8	Preliminary analysis of the data.	2
Lec 9	The point estimate.	2
Lec 10	Maximum likelihood estimators.	2
Lec 11	Confidence intervals for the mean and variance of the normal distribution and the aspect ratio.	2
Lec 12	Testing statistical hypotheses. Tests for the mean and variance for a normal distribution and proportion.	2
Lec 13	Compliance tests and independence tests. Chi-square test.	2
Lec 14	Analysis of variance. Simple linear regression.	2
Lec 15	Repertory.	2
	Total hours	**30**

Form of classes - class		Number of hours
Cl 1	Determination and calculation of the probability of events - accounting exercises.	2
Cl 2	Conditional probability - examples and tutorials.	2
Cl 3	Independence of events - examples, tutorials. Reliability of connections - accounting exercises.	2
Cl 4	Random variable. Probability distribution. The distribution of the random variable. Analysis of the properties of the distributions of random variables. Examples of phenomena of the distribution.	2
Cl 5	Basic parameters of the random variable and their interpretation - tutorials.	2
Cl 6	Important inequalities in probability theory, limit theorems and their interpretation - tutorials.	2
Cl 7	Preliminary analysis of the data. Examples of data analysis problems. Types of analytical variables. Examples and tutorials.	2
Cl 8	Point estimation - tutorials.	2
Cl 9	Maximum likelihood estimators - tutorials.	2
Cl 10	Confidence intervals for the mean and variance of the normal distribution and the aspect ratio. Classes.	2
Cl 11	Statistical hypothesis testing - examples. Tests for the mean and variance of the normal distribution and the ratio - examples and tutorials.	2
Cl 12	Compliance tests and chi-square independence - tutorials.	2
Cl 13	Analysis of variance. Simple linear regression. Examples and tutorials.	2
Cl 14	Simple linear regression.	2
Cl 15	Final test.	2
	Total hours	**30**
Form of classes - laboratory		**Number of hours**
Lab 1		
Lab 2		
…		
	Total hours	
Form of classes - project		**Number of hours**
Proj 1		
Proj 2		
…		
	Total hours	
Form of classes - seminar		**Number of hours**
Sem 1		
Sem 2		
…		
	Total hours	

TEACHING TOOLS USED

N1. Traditional lecture. Slideshows.
N2. Tutorials and discussion of solutions of the foundations of probability theory and the reliability of systems. Discussing and presenting solutions lists. Final test of the exercise.
N3. Counseling for students.
N4. Self-study students - solving task lists.
N5. Own work - self-study problems of lecture and exam preparation.

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	PEK_U01-PEK_U04	Examples and tutorials. Solving lists. Analysis of system reliability problems.
C	PEK_W01-PEKW_07, PEK_K01	Examination.

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] J. Bartos, W. Dyczka, W. Krysicki, Rachunek prawdopodobieństwa i statystyka matematyczna w zadaniach, PWN, Warszawa 2008.
[2] J. Jakubowski, R. Sztencel, Rachunek prawdopodobieństwa dla prawie każdego, Script, Warszawa, 2009.
[3] A. Plucińska, E. Pluciński, Rachunek prawdopodobieństwa, WNT, Warszawa 1999.
[4] R. Zieliński, Tablice statystyczne, WNT, Warszawa 2006.
[5] J. Koronacki, J. Mielniczuk, Statystyka dla studentów kierunk. technicznych i przyrodniczych, WNT, Warszawa 2001.
[6] L. Gajek, M. Kaluszka, Wnioskowanie statystyczne. Modele i metody, Wydawnictwa Naukowo-Techniczne, Warszawa 1984.
[7] D. Bobrowski, Probabilistyka w zastosowaniach technicznych, WNT, Warszawa 1986.
[8] D. Bobrowski, Modele i metody matematyczne teorii niezawodności w przykładach i zad., WNT, Warszawa 1985.
[9] M. Fisz, Probability Theory and Mathematical Statistics, 3 Edition, Krieger Pub Co, June 1980.
[10] D.C.Montgomery, G.C.Runger, Applied Statistics and Probability for Engineers. Third Ed., John Wiley & Sons, New York 2003.

SECONDARY LITERATURE:

[1] W. Feller, Wstęp do rachunku prawdopodobieństwa, tom I.II, PWN, Warszawa 2009.
[2] G. Grimmet, D. Stirzaker, One thousand exercises In probability, Oxford University Press, 2004.
[3] H. Jasiulewicz, W. Kordecki, Rachunek prawdopodobieństwa i statystyka matematyczna. Definicje, twierdzenia, wzory, GiS, Wrocław 2001.
[4] H. Jasiulewicz, W. Kordecki, Rachunek prawdopodobieństwa i statystyka matemat. Przykł. i zad., GiS, Wrocław 2001.
[5] M. Maliński, Weryfikacja hipotez statystycznych wspomagana komputerowo, Wyd. Politechn. Śląskiej, Gliwice 2004.
[6] H.Kobayashi, B.L.Mark, W.Turin, Probability, Random Processes, and Statistical Analysis, Cambridge University Press 2012.
[7] D.R.Cox, C.A.Donnelly, Principles of Applied Statistics, Cambridge University Press 2011.
[8] L.Chaumont, M.Yor, Exercises In Probability, Cambridge University Press 2011.

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Probability theory and mathematical statistics

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Information and Computer Science

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***	Program content***	Teaching tool number***
PEK_W01 (knowledge)	K1INF_W02	C1	Wy1-Wy2	N1, N3, N5
PEK_W02	K1INF_W02	C2	Wy3-Wy4	N1, N3, N5
PEK_W03	K1INF_W02	C3	Wy5-Wy6	N1, N3, N5
PEK_W04	K1INF_W02	C3	Wy7-Wy8	N1, N3, N5
PEK_W05	K1INF_W02	C3	Wy9-Wy10	N1, N3, N5
PEK_W06	K1INF_W02	C3	Wy11-Wy12	N1, N3, N5
PEK_W07	K1INF_W02	C3	Wy13-Wy15	N1, N3, N5
PEK_U01 (skills)	K1INF_W02	C1	Ćw1-Ćw3	N2, N3, N4
PEK_U02	K1INF_W02	C2	Ćw3	N2, N3, N4
PEK_U03	K1INF_W02	C3	Ćw4-Ćw7	N2, N3, N4
PEK_U04	K1INF_W02	C3	Ćw8-Ćw15	N2, N3, N4
PEK_K01 (competences)	K1INF_W02	C1-C3	Wy1-Wy15	N1, N3, N5

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY Computer Science & Management…… / DEPARTMENT……

SUBJECT CARD

Name in Polish :…Logika i Matematyka Dyskretna
Name in English: Logics and Discrete Mathematics
Main field of study (if applicable): Computer Science…….
Specialization (if applicable): ……..
Level and form of studies: 1st level, full-time
Kind of subject: obligatory
Subject code …INZ0258W, INZ0258C…….
Group of courses : 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	90			
Form of crediting	Examination	crediting with grade			
For group of courses mark (X) final course					
Number of ECTS points	3	3			
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes	1,8	1,8			

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Has a basic knowledge of Linear Algebra
2. Has basic skills in manipulation of algebraic formulas

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SUBJECT OBJECTIVES

C1 Acquisition of knowledge about basic definitions of Propositional Calculus
C2 Acquisition of knowledge about Logical Equivalences and Implications
C3 Acquisition of knowledge about diverse Methods of Proofs
C4 Acquisition of knowledge about Predicate Calculus and Infinite Sets
C5 Acquisition of knowledge about Relations, especially Equivalence Relations and Ordering Relations
C6 Acquisition of knowledge about selected Counting Methods
C7 Acquisition of knowledge about Graphs and Trees
C8 Acquisition of knowledge about Depth Search of Trees & Polish Notation
C9 Acquisition of knowledge about Computational Complexity & Big-Oh Notation
C10 Acquisition of knowledge about Permutations and Groups
C11 Development of skill of manipulating Logic Formulas
C12 Development of skill of proving Logic Theses
C13 Development of skill of classifying Relations
C14 Development of skill of applying various Counting Methods
C15 Development of skill of using various Algorithms of Depth Search of Trees
C16 Development of skill of using Big-Oh Notation in analysis of Computational Complexity
C17 Development of skill of using and manipulating cyclic notation of Permutations

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Knows basic definitions of Propositional Calculus
PEK_W02 Knows basic Logic Equivalences and Implications
PEK_W03 Knows basics of Predicate Calculus and Methods of Proofs
PEK_W04 Knows basic definitions of Relations, Equivalence Classes and Orders
PEK_W05 Knows basics of Counting Methods
PEK_W06 Knows basic definitions of Graphs and Trees
PEK_W07 Knows various algorithms for Depth Search of Trees and the idea of Polish Notation
PEK_W08 Knows Big- Oh Notation and its application to analysis of Computational Complexity
PEK_W09 Knows basics of Group Theory, exemplified by Permutation Groups

relating to skills:

PEK_U01 Can manipulate formulas of Propositional Calculus
PEK_U02 Can manipulate formulas of Predicate Calculus
PEK_U03 Can prove Logic Theorems directly and indirectly
PEK_U04 Can analyze various properties of Relations and classify them
PEK_U05 Can apply various Counting Methods to find number of elements in sets
PEK_U06 Can apply various algoriths for Depth Search of Trees
PEK_U07 Can change formulas in Polish and Inverse Polish Notations to ordinary (infix) notation and vice versa
PEK_U08 Can apply Big-Oh Notation to analyze Computational Complexity.
PEK_U09 Can use cyclic notation in analysis of Permutation Groups

relating to social competences:

PEK_K01 Understands the importance of logic reasoning in everyday life and improves his/her skills in this field

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Propositions. Propositional Calculus	2
Lec 2	Logical Equivalences and Implications	2
Lec 3	Methods of Proofs: Direct & Indirect	2
Lec 4	Methods of Proofs: Gentzen Sequents	2
Lec 5	Predicate Calculus. Infinite Sets	2
Lec 6	Sets. Relations. Functions.	2
Lec 7	Equivalence Relations. Equivalence Classes	2
Lec 8	Ordering Relations. Special Orders.	2
Lec 9	Counting Methods	2
Lec 10	Introduction to Graphs and Trees	2
Lec 11	Depth Search of Trees. Polish Notation	2
Lec 12	Euler Problem. Hamilton Problem	2
Lec 13	Computational Complexity. Big-Oh Notation	2
Lec 14	Permutations	2
Lec 15	Algebraic Structures. Groups	2
	Total hours	30

Form of classes - class		Number of hours
Cl 1	Practical Formulation of Propositions and their Logic Notation	2
Cl 2	Exercises in Logical Equivalences and Implications	2

Cl 3	Exercises in Direct and Indirect Proofs	2
Cl 4	Indirect Proofs by Gentzen Sequents	2
Cl 5	Exercises in Predicate Calculus. Distinguishing Countable and Not Countable Sets.	2
Cl 6	Investigation of Basic Properties of Relations and Functions	2
Cl 7	Identification of Equivalence Relations and their Equivalence Classes	2
Cl 8	Identification of Ordering Relations and Special Orders	2
Cl 9	Exercises in various techniques of Counting	2
Cl 10	Exercises in basic properties of Graphs and Trees	2
Cl 11	Procedures of Depth Search of Trees. Exercises in Polish Notation	2
Cl 12	Existence of Solutions to Euler & Hamilton Problems	2
Cl 13	Determination of Computational Complexity of Algorithms. Use of Big-Oh Notation	2
Cl 14	Exercises in presenting Permutations in Cyclic Notation	2
Cl 15	Properties of Groups (in case of Permutational Groups)	2
	Total hours	30

TEACHING TOOLS USED

N1. Traditional lecture using board/video projector
N2. Tutorial classes
N3. Consultations
N4. Student's home work

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_U01... PEK_U09	Oral answers, problem solving on board
F2	PEK_W01... PEK_W09	Attendance & activity during classes
F3	PEK_U01... PEK_U09	Written test
P1 (E)	PEK_W01... PEK_W09	Written Examination
P2 = 0,3 * F1 + 0,1 * F2 + 0,6 * F3		crediting for classes

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Ross K. A., Wright C. R. B., Discrete Mathematics. Prentice Hall Inc.
[2] Aho A.V., Hopcroft J.E., Ullman J.D., Design and Analysis of Computer Algorithms. Wiley and Sons.
[3] Wilson, R.J., Introduction to Gaph Theory. Wiley and Sons.

SECONDARY LITERATURE:

[1] Lipski W. Combinatorics for Computer Programmists, WNT (in Polish)

SUBJECTS SUPERVISOR (NAME &SURNAME, E-MAIL ADDRESS)

Andrzej Gawrych-Żukowski, andrzej.gawrych-zukowski@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Logics and Discrete Mathematics

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

…Computer Science……..

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)	K1INF_W02	C1	Lec1	N1, N3, N4
PEK_W02	K1INF_W02	C2	Lec2	N1, N3, N4
PEK_W03	K1INF_W02	C3,C4	Lec3,Lec4&5	N1, N3, N4
PEK_W04	K1INF_W02	C5	Lec6,Lec7&8	N1, N3, N4
PEK_W05	K1INF_W02	C6	Lec9	N1, N3, N4
PEK_W06	K1INF_W02	C7	Lec10.Lec11	N1, N3, N4
PEK_W07	K1INF_W02	C8	Lec11,Lec12	N1, N3, N4
PEK_W08	K1INF_W02	C9	Lec13	N1, N3, N4
PEK_W09	K1INF_W02	C10	Lec14,Lec15	N1, N3, N4
PEK_U01 (skills)	K1INF_W17	C11	Cl1	N2, N3, N4
PEK_U02	K1INF_W17	C11	Cl2	N2, N3, N4
PEK_U03	K1INF_W17	C12	Cl3,Cl4,Cl5	N2, N3, N4
PEK_U04	K1INF_W17	C13	Cl6,Cl7.Cl8	N2, N3, N4
PEK_U05	K1INF_W17	C14	Cl9	N2, N3, N4
PEK_U06	K1INF_W17	C15	Cl10, Cl11	N2, N3, N4
PEK_U07	K1INF_W17	C!5	Cl11, Cl12	N2, N3, N4
PEK_U08	K1INF_W17	C16	Cl13	N2, N3, N4
PEK_U09	K1INF_W17	C17	Cl14, Cl15	N2, N3, N4
PEK_K01 (competences)	K1INF_W02	C1...C4	Lec1...Lec5	N1, N3, N4

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

*** - from table above

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish …Podstawy Elektroniki i Miernictwa…….
Name in English…Electronics and Metrology – basic principles
Main field of study (if applicable): Computer Science
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)	30	15	30		
Number of hours of total student workload (CNPS)	150		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	X			
Number of ECTS points	5		2		
including number of ECTS points for practical (P) classes			1		
including number of ECTS points for direct teacher-student contact (BK) classes	3		1,2		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of the Mathematical Analysis and Physics

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SUBJECT OBJECTIVES

C1 Introducing the students to the principles of the work of semiconductor devices
C2 Take possession of the basic knowledge about the physical properties of the semiconductor materials, band theory of the materials and main properties of the bipolar and unipolar devices.
C3 Presentation of the principles of the measurements of electrical quantities and the basics of the electronic circuits and optoelectronics.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 ma podstawową wiedzę związaną z prawami rządzącymi przepływem prądu elektrycznego w obwodzie elektrycznym

PEK_W02 zna budowę, zasadę działania i podstawowe zastosowania przyrządów półprzewodnikowych takich jak np. dioda, tranzystory bipolarne i unipolarne

PEK_W03 ma podstawową wiedzę z zakresu miernictwa elektrycznego

relating to skills:

PEK_U01 potrafi analizować i projektować proste, liniowe układy elektryczne

PEK_U02 potrafi analizować i projektować układ elektryczny z elementami nieliniowymi

PEK_U03 potrafi zaprojektować stabilizator oparty na diodzie Zenera

…

relating to social competences:

PEK_K01 potrafi wyszukiwać i korzystać z literatury zalecanej do kursu

PEK_K02 rozumie konieczność systematycznej pracy w celu opanowania materiału kursu

PEK_K03 identyfikuje zastosowania elektroniki w różnych dziedzinach życia

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	*The circuit of the direct current. RLC circuits*	*2*
Lec 2	*The basics of the electronics measurements*	*2*
Lec 3	*Physical basics of the semiconductor materials*	*2*
Lec 4	*P-n junction principle of the operation, and it properties*	*2*
Lec 5	*Semiconductor's diodes and their applications in electronic circuits*	*2*
Lec 6	*Bipolar transistors, principles of the operation, characteristics, applications in electronic circuits*	*2*
Lec 7	*Field Effect Transistors, principles of the operation and applications in electronic circuits*	*2*
Lec 8	*. Integrated circuits, methods of the realization of semiconductor devices*	*2*
Lec 9	*Logic gates and inverters*	*2*
Lec 10	*Semiconductor memories*	*2*
Lec 11	*Non semiconductor memories*	*2*

Lec 12	*D/A and A/D converters*	*2*
Lec 13	*Linear integrated circuits*	*2*
Lec 14	*Optoelectronic*	*2*
Lec 15	*Colloquy*	*2*
	Total hours	*30*

Form of classes - class		**Number of hours**
Cl 1	*Organization time*	1
Cl 2	*Connections of the electronics elements, Kirchoff's, Norton's and Ohm's laws*	2
Cl 3	*Analysis of the circuits with nonlinear elements*	2
Cl 4	*Zener's diode as a voltage stabilizer*	2
Cl 5	*Charging and discharging capacitor*	2
Cl 6	*Voltage divider, RLC circuits*	2
Cl 7	*Resonanse circuits*	2
Cl 8	*Colloquy*	2
	Total hours	15

Form of classes - laboratory		**Number of hours**
Lab 1	*Organization time*	2
Lab 2	*Operation of the measurement instruments, basics of the measurement of the current and voltage*	2
Lab 3	*I=f(U) characteristic of the p-n junction*	2
Lab 4	*Zener's diode, project of the stabilizer*	2
Lab 5	*The measurement of the power consumption of the TTL and CMOS gates*	2
Lab 6	*Static characteristics of the TTL logical gates*	2
Lab 7	*Transoptors*	2
Lab 8	*Static characteristics of the bipolar transistors*	2
Lab 9	*Static characteristics of the unipolar transistors*	2
Lab 10	*Dynamic characteristics of the TTL and CMOS logical*	2
Lab 11	*Frequency limitations of the bipolar transistors*	2
Lab 12	*Switching operation of the bipolar transistor*	2
Lab 13	*Using oscilloscope to the measurement characteristics of the electronic elements*	2
Lab 14	*Additional laboratory*	2
Lab 15	*Additional laboratory*	2
	Total hours	30

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lecture – use of multimedia

N2. Laboratory – traditional method

N3. Consultations

N4. Work of personal student

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 Laboratory	PEK_U01, PEK_U02, PEK_U03, PEK_K01	reports
F2 Classes	PEK_U01-PEK_U03	tests
P1 Lecture	PEK_W01, PEK_W02, PEK_W03, PEK_K02, PEK_K03	Final colloquy at the end of the semester

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] [1] A. Zatorski, Podstawy miernictwa elektrycznego, Kraków AGH, 2011
[2] J. Hennel, Podstawy elektroniki półprzewodnikowej, Warszawa, Wydawnictwo NT 2003

SECONDARY LITERATURE:

[1] [1] A.Świt, J. Pułtorak, Przyrządy Półprzewodnikowe, Warszawa, WTN 1979
[2] S. Lebson, Podstawy miernictwa elektrycznego, WNT, 1972

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Electronics and Metrology – basic principles……

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science

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 (knowledge)	K1INF-W08	C1	Lec 1	1,3,4
PEK_W02	K1INF-W08	C2, C4	Lec 3-Lec 13	1,3,4
PEK_W03	K1INF-W08	C3	Lec2	1,3,4
…				
PEK_U01 (skills)	K1INF-W07, K1NF-U-14	C2, C3	L2, L3	2,3,4
PEK_U02	K1INF-W07, K1NF-U14	C2-C4	L4, L6-L12	2,3,4
PEK_U03	K1INF-W07, K1INF-U14	C2, C3	L4, L5	2,3,4
PEK_K01 (competences)	K1INF_K01 K1INF_K02 K1INF_K03	C1-C4	lec1-Lec14 L2-L13	1-4
PEK_K02	K1INF_K01 K1INF_K02 K1INF_K03	C1-C4	Lec1-Lec14 L2-L13	1-4
PEK_K03	K1INF_K01 K1INF_K02 K1INF_K03	C1-C4	Lec1-Lec14 L2-L13	1-4

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

*** - from table above

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish *Architektura klient-serwer*
Name in English *Client-Server Architecture*
Main field of study (if applicable): Computer Science
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)	30			30	
Number of hours of total student workload (CNPS)	60			90	
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					
Number of ECTS points	2			3	
including number of ECTS points for practical (P) classes	0			2	
including number of ECTS points for direct teacher-student contact (BK) classes	1			1	

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Is able to develop software application in chosen programming language
2.
3.

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SUBJECT OBJECTIVES

C1 To enhance students' knowledge about modern client-server architectures
C2 To learn how to practically use client-server architecture in building software systems

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 Has a basic knowledge about modern client-server architectures
PEK_W02 Has a basic knowledge necessary to utilize client-server architecture in software development
…
relating to skills:
PEK_U01Is able to discus and evaluate the advantages of using client-server
PEK_U02 Is able to utilize client-server architecture in software development

…
relating to social competences:
PEK_K01Is able to work in and manager a small software development team

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours**
Lec 1	Introduction to Client-Server Architecture	2
Lec 2	The Client Server Model And Software Design	2
Lec 3	Client/Server Building Blocks	2
Lec 4	Clients, Servers and Operating Systems	2
Lec 5	Algorithms & Issues in Client Software Design	2
Lec 6	Base Middleware	2
Lec 7	RPC, Messaging and Peer-to-Peer	2
Lec 8	Database Servers	2
Lec 9	Transaction Processing	2
Lec 10	Client/Server with distributed Objects	2
Lec 11	Client/Server and the Internet	2
Lec 12	Service Oriented Architecture SOA	2
Lec 13	Intro to Web Services	2
Lec 14	Describing Web Services: WSDL	2
Lec 15	Test	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		**Number of hours**
Lab 1		
Lab 2		
Lab 3		
Lab 4		
Lab 5		
…		

	Total hours	

Form of classes - project		Number of hours
Proj 1	Introduction, Project teams building	2
Proj 2	Brainstorming	2
Proj 3	Presentation of self prepared or chosen idea of client/server solution.	2
Proj 4	Building final, revised concept of projected solution.	2
Proj 5	Setup of project's infrastructure	2
Proj 6	Sprint 1 Iteration 1	2
Proj 7	Sprint 1 Iteration 2	2
Proj 8	Sprint 1 Iteration 3 and sprint demo	2
Proj 9	Sprint 2 Iteration 1	2
Proj 10	Sprint 2 Iteration 2	2
Proj 11	Sprint 2 Iteration 3 and sprint demo	2
Proj 12	Sprint 3 Iteration 1	2
Proj 13	Sprint 3 Iteration 2	2
Proj 14	Sprint 3 Iteration 3 and sprint demo	2
Proj 15	Final assessment	2
	Total hours	30

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lecture
N2. The course web page with references to literature
N3. Software development tools

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_U01-02, PEK_K01	Evaluation of the concept of solution [20 points] (Lab1-4)
F2	PEK_U01-02,	Evaluation of the sprint demo 1[20 points] (Lab5-8)

	PEK_K01	
F3	PEK_U01-02, PEK_K01	Evaluation of the sprint demo 2[20 points] (Lab9-11)
F4	PEK_U01-02, PEK_K01	Evaluation of the sprint demo 3[40 points] (Lab12-14)
C1	PEK_U01-02, PEK_K01	C1 is based on the sum of the points from F1…F4. At least 50% of points is required.
C2	PEK_W01-02	C2 is based on the result of a written test covering material presented during lectures. At least 50% of points is required to pass the test.
C		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Client/Server Survival Guide, 3rd Edition by Robert Orfali, Dan Harkey and Jeri Edwards, John Wiley, 1999
[2] Internetworking with TCP/IP Vol III, Client/Server Programming & Applications (Linux/POSIX Sockets Version), Douglas E. Comer and David L. Stevens Prentice Hall 2001
[3]

SECONDARY LITERATURE:

[1] Schank J.D.: Novell's Guide to Client-Server Application and Architecture, Novell Press, Sybex, 1994.
[2] Hall C.L.: Technical Foundations of Client/Server Systems, John Wiley & Sons. Inc., 1994.
[3]

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Client-Server Architecture

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 (knowledge)	K1INF_W10 K1INF_W11	C1	Lec1-Lec14	N1 – N2
PEK_W02	K1INF_W11 K1INF_W10	C1-C2	Lec1-Lec14	N1 – N2
PEK_U01 (skills)	K1INF_U10	C1-C2	Lec1-Lec14 Proj1-Proj15	N1 – N3
PEK_U02	K1INF_U06	C2	Proj1-Proj15	N3
PEK_K01 (competences)	K1INF_K03	C2	Proj1-Proj15	N1 – N3

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

*** - from table above

FACULTY of Computer Science and Management / DEPARTMENT

SUBJECT CARD

Name in Polish Multimedialne Systemy Wbudowane
Name in English Multimedi Embedded Systems
Main field of study (if applicable): Computer Science
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)	30		30		
Number of hours of total student workload (CNPS)					
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	3		3		
including number of ECTS points for practical (P) classes			3		
including number of ECTS points for direct teacher-student contact (BK) classes	1,5		1,5		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Web-based systems programming.
2. Knowledge in computer science basics.

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SUBJECT OBJECTIVES

C1 Acquisition of the basic knowledge in Digital Multimedia
C2 Acquisition of the basic knowledge in Embedded Systems Design
C3 Skill in Multimedia Embedded Systems Implementation and Evaluation

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 student has a basic knowledge in the field of Multimedia Embedded Systems applications and design
PEK_W02 student has a basic knowledge in the field of Multimedia Embedded Systems implementation and usability verification

relating to skills:

PEK_U01 student is able to design a simple multimedia embedded system

PEK_U02 student is able to implement and verify a simple multimedia embedded system

relating to social competences:
PEK_K01 student is able to use the course literature and find relevant information using other sources
PEK_K02 student is able to cooperate with other students within a project team

PROGRAMME CONTENT

Form of classes – lecture		**Number of hours**
Lec 1	Introduction to the multimedia systems.	2
Lec 2	Multimedia embedded systems applications.	2
Lec 3	Platforms of multimedia embedded systems.	2
Lec 4	Computer graphics.	2
Lec 5	Video, animation and sound.	2
Lec 6	Text and hypertext.	2
Lec 7	Visual design and interactivity.	2
Lec 8	XML and scripting.	2
Lec 9	Multimedia embedded systems design.	2
Lec10	Developing iOS and Android applications	2
Lec11	HTML 5.	2
Lec12	jQuery mobile.	2
Lec13	Designing of mobile applications – practice and new trends.	2
Lec14	Usability tests.	2
Lec15	Multimedia embedded systems perspectives.	2
	Total hours	30

Form of classes – class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes – laboratory		**Number of hours**
Lab 1	Mobile application usability examination.	2
Lab 2	Mobile application usability examination.	2
Lab 3	Embedded system mock-up preparation	2
Lab 4	Embedded system mock-up preparation	2
Lab 5	Embedded system prototype implementation with final version of texts	2

Lab 6	Embedded system prototype implementation with final version of images	2
Lab 7	Comparison of interaction of the design application with other similar commercial applications	2
Lab 8	Embedded system implementation of the basic application elements	2
Lab 9	Embedded system implementation of the basic application elements	2
Lab10	Embedded system implementation of the interactive application elements	2
Lab11	Embedded system implementation of the interactive application elements	2
Lab12	Embedded system implementation of the advanced application elements	2
Lab13	Embedded system implementation of the advanced application elements	2
Lab14	Embedded system implementation verification	2
Lab15	Embedded system implementation improvement	2
	Total hours	30

Form of classes – project		**Number of hours**
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes – seminar		**Number of hours**
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lecture with presentations
N2. Consultations
N3. Literature studies
N4. Laboratories at the computer laboratory
N5. Students self work and laboratory preparation
N6. Reports preparation
N7. Tests with eLearning tool

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at	Educational effect numer	Way of evaluating educational effect achievement

semester end)		
F- laboratory	PEK_U01, PEK_U02, PEK_K01, PEK_K02	Laboratories completion and reports preparation.
P- lecture	PEK_W01, PEK_W02 PEK_K01,	Final test
C		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Chapman N., Chapman J., *Digital media. Third edition*. Ontario: John Wiley & Sons Ltd., 2009.
[2] Mark Pearrow, Web Site Usability. Handbook. Charles River Media 2004.
[3] Maximiliano Firtman, *jQuery Mobile: Up and Running.* O'Reilly Media 2012. http://proquestcombo.safaribooksonline.com/book/-/9781449331085
[4] C Bala Kumar , Paul Kline , Tim Thompson, Bluetooth Application Programming with the Java APIs.The Morgan Kaufmann Publ. 2004.
[5] Mohammad Ilyas, Imad Mahgoub, (ed.), Mobile computing handbook. Boca Raton: Auerbach Publications, cop. 2005.
[6] Martin J. Wells, J2ME Game Programming (Game Development)**.** Premier Press 2004.
[7] Peter Marwedel, *Embedded System Design: Embedded Systems Foundations of Cyber-Physical. Springer 2011* http://www.springer.com/engineering/circuits+%26+systems/book/978-94-007-0256-1

SECONDARY LITERATURE:

[1] Jon Reid, JQuery Mobile. O'Reilly Media 2011.
[2] J.D. Gibson (ed.), *Multimedia Communications. Directions & Innovations.* San Diego: AP 2001.

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……

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 (knowledge)	K1INF_W09	C1,C2	Lec1-Lec8,Lec15	N1-N3, N7
PEK_W02	K1INF_W09	C1,C3	Lec9-Lec14	N1-N3, N7
PEK_U01 (skills)	K1INF_U06, K1INF_U14	C1,C2	Lab3-Lab7	N2-N6
PEK_U02	K1INF_U04, K1INF_U06, K1INF_U14	C1,C3	Lab1, Lab8-Lab15	N2-N6
PEK_K01 (competences)		C1,C2	Lab1-Lab15	N2, N7
PEK_K02		C3	Lab2-Lab15	N2-N6

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

*** - from table above

FACULTY Informatics and Management / DEPARTMENT of Informatics

SUBJECT CARD

Name in Polish Wprowadzenie do Inżynierii Oprogramowania
Name in English Introduction to Software Engineering
Main field of study (if applicable): Informatics
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)	30	15	15		
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					
Number of ECTS points	2	1	2		
including number of ECTS points for practical (P) classes		1	1		
including number of ECTS points for direct teacher-student contact (BK) classes	1	1	1		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of object-oriented programming language (e.g. java)

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SUBJECT OBJECTIVES

C1. To obtain basic knowledge of software engineering, including knowledge of: development life cycle models, requirements engineering issues, domain analysis and software testing.
C2. To gain practical skills in requirements specification, domain modeling and test cases definition.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01. A student knows basic software life-cycle models, processes and languages used for software system specification
PEK_W02. A student knows basic diagrams used for requirement specification and domain modeling.
PEK_W03. A student distinguishes different kind of tests, and test levels.

relating to skills:

PEK_U01. A student creates simple models representing functional requirements and basic

entities in a modeled domain
PEK_U02. A student proposes a user-interface, and necessary documents
PEK_U03. A student specifies in a formal language business constraints
PEK_U04. A student specifies unit tests for source code, and functional test-cases

PROGRAMME CONTENT

Form of classes – lecture		**Number of hours**
Lec 1	Introduction. Basic notions in software engineering.	2
Lec 2	Software life-cycle processes. Software life-cycle models. Software development methodologies.	2
Lec 3	Fundamentals of requirement engineering.	2
Lec 4	Modeling of structure and behavior of software systems.	2
Lec 5	OCL as a formal specification language.	2
Lec 6	Human-computer interaction. Standards.	2
Lec 7	Software design.	2
Lec 8	Construction. Style guidelines. Source code versioning.	2
Lec 9	Software quality during the development.	2
Lec 10	Testing – types, techniques; automatic testing	2
Lec 11	Software system deployment.	2
Lec 12	Problems and methods of software maintenance.	2
Lec 13	Organization of software design.	2
Lec 14	Configuration management and change management.	2
Lec 15	Repetition.	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1	Introduction	1
Cl 2	Use-case models	2
Cl 3	Use-case specifications	2
Cl 4	User-interface prototype	2
Cl 5	Domain model	2
Cl 6	Formal specification of business constraints	2
Cl 7	Unit, and functional test-cases specification	2
Cl 8	Final test	2
	Total hours	15

Form of classes – laboratory		**Number of hours**
Lab 1	Introduction	1

Lab 2	Use-case models	2
Lab 3	Use-case scenarious	2
Lab 4	GUI prototype	2
Lab 5	Domain models	2
Lab 6	OCL constraints	4
Lab 7	Test-cases	2
	Total hours	15

TEACHING TOOLS USED

N1. Informative lecture supported by multimedia presentations
N2. Case tools, IDE used for programming and testing
N3. Examples of documents
N4. E-learning system used for materials publication

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
F0 – class activity	PEK_U01,… PEK_U04	A student can receive up to 1 points during each classes for activity (presenting task solution, discussion)
F1 – class test	PEK_U01,… PEK_U04	A test with several practical task to be solved. The tasks are assessed against their correctness, completeness, etc. and scored in points
F2 – class final grade	PEK_U01,… PEK_U04	A grade calculated on the base of NP=F0+F1 according to the formula: <50%, 60%) → 3.0 <60%, 70%) →3.5 <70%, 80%) → 4.0 <80%, 90%) → 4.5 <90%, 95%) → 5.0 <95%, 100%> → 5.5
F3 – lab 2-3	PEK_U01	Correctness, and completeness of solution of specified tasks, scored in points (max 25% of the lab final grade)
F4 – lab 4-5	PEK_U01, PEK_U02	Correctness, and completeness of solution of specified tasks, scored in points (max 25% of the lab final grade)
F5 – lab 6	PEK_U03	Correctness, and completeness of solution of specified tasks, scored in points (max 25% of the lab final grade)
F6 – lab 7	PEK_U04	Correctness, and completeness of solution of specified tasks, scored in points (max 25% of the lab final grade)
F7 – lab final grade	PEK_U01, PEK_U02, PEK_U03	A grade calculated on the base of NP=F3+F4+F5+F6 according to the formula: <50%, 60%) → 3.0 <60%, 70%) →3.5 <70%, 80%) → 4.0 <80%, 90%) → 4.5 <90%, 95%) → 5.0 <95%, 100%> → 5.5

F8 – exam	PEK_W01, PEK_W02, PEK_W03	Test scored in points. The final grade evaluated by the formula: <50%, 60%) → 3.0 <60%, 70%) →3.5 <70%, 80%) → 4.0 <80%, 90%) → 4.5 <90%, 95%) → 5.0 <95%, 100%> → 5.5
P – final grade	PEK_W01, PEK_W02, PEK_W03,	The grade is calculated as: 0.3 * F2 + 0.4 * F7 + 0.3 * F8

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] R. Pressman, Software Engineering: A Practitioner's Approach 7th edition, McGraw-Hill 2009
[2] M. D. Hamlet, J. Maybee, The Engineering of Software: A Technical Guide for the Individual, Addison-Wesley 2000

SECONDARY LITERATURE:

[1] M. Fowler, UML Distilled 3rd edition, Addison-Wesley 2004
[2] T. Clark, Object Modeling with the OCL: The rationale behind the Object Constraint Language, Springer 2002

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Introduction to Software Engineering

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Informatics

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	K1INF_W07	C1	Lec2… Lec14	N1, N4
PEK_W02	K1INF_W07	C1	Lec3 … Lec7	N1, N3, N4
PEK_W03	K1INF_W07	C1	Lec9 … Lec10	N1, N4
PEK_U01	K1INF_U03	C2	Cl2, Cl3, Cl5 Lab2, Lab3, Lab5	N2, N4
PEK_U02	K1INF_U03	C2	Cl4, Lab4	N2, N4
PEK_U03	K1INF_U03	C2	Cl5, Lab6	N2, N4
PEK_U04	K1INF_U03	C2	Cl7, Lab7	N2, N4

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

*** - from table above

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish Projektowanie bazy danych
Name in English Database Design
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 INZ0266Wp
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)	30			120	
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	1			4	
including number of ECTS points for practical (P) classes	0			2	
including number of ECTS points for direct teacher-student contact (BK) classes	1			2	

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. General IT knowledge
2. Basic knowledge about databases, data models, DBMS

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SUBJECT OBJECTIVES

C1 Gaining the basic knowledge about database design, data models and their implementation in a DBMS
C2 Acquisition of the ability to define and process data stored in databases

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Describes the principles of data modeling at different levels of abstraction -> W07
PEK_W02 Presents basic transformation rules of data models and their verification -> W07
PEK_W03 Describes implementation rules of data models in a DBMS -> W07
PEK_W04 Presents the role and possibilities of using the SQL standard in a DBMS systems -> W16
PEK_W05 Knows rules and tools for testing databases -> W16
PEK_W06 Knows methods of database tuning -> W16
PEK_W07 Defines the rules for defining architecture of database systems -> W22

relating to skills:

PEK_U01 Defines requirements for databases -> U03, U04
PEK_U02 Defines a conceptual data model using the UML -> U04
PEK_U03 Transforms conceptual data model into a physical model, taking into account the business rules and domain constraints -> U04
PEK_U04 Knows and is able to determine indexes for databases -> U16, U19
PEK_U05 Defines queries using DML database languages and their implementation in a DBMS for searching and processing of data in databases -> U04, U16, U19
PEK_U06 Knows and applies database security -> U09
PEK_U07 Defines project documentation -> U03

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction - General Course Information – Database Life Cycle	2
Lec 2	Database Design Methodology, Model Driven Architecture (MDA)	2
Lec 3	Requirements Specification Techniques	2
Lec 4	Data modeling at different levels of abstractions	2
Lec 5	UML Modeling – Classes, Relationships, Verification and Validation	2
Lec 6	Mapping Conceptual Data Models to Relations	2
Lec 7	Implementation of conceptual data models using the SQL standard DDL	2
Lec 8	Introduction to Physical Database Design	2
Lec 9	Basic Indexing Methods	2
Lec 10	Query Optimization and Plan Selection	2
Lec 11	Designing and Maintaining Indexes	2
Lec 12	Distributing and Partitioning Data	2
Lec 13	Designing Security	2
Lec 14	Database Testing	2
Lec 15	Test	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1		

Cl 2		
…		
	Total hours	

Form of classes - laboratory		Number of hours
Lab 1		
Lab 2		
…		
	Total hours	

Form of classes - project		Number of hours
Proj 1	Health and safety training. Conditions of the course. Topics of projects	2
Proj 2	Business analysis of problem domains (P01)	2
Proj 3	System Requirements Analysis (P02)	2
Proj 4	User stories, software requirements specification, definition of actors (P03)	2
Proj 5	Specifications of functional requirements using Use Cases, CRUD matrix (P03)	2
Proj 6	Definition of business Rules and constraints, Definition of database operations (P04)	2
Proj 7	Conceptual data model (P05)	2
Proj 8	Data model verification in the context of defined business rules and constrains (P06)	2
Proj 9	Implementation of Conceptual Data Model in MS SQL 2012 or Oracle (P07)	2
Proj 10	Definition of test cases (P08)	2
Proj 11	Generating test data (P08)	2
Proj 12	Testing SQL queries, Analysis of queries execution plans (P08)	2
Proj 13	Tuning – indexes selection, materialized views selection, partitioning (P09)	2
Proj 14	Preparing final project documentation (P10)	2
Proj 15	Presentation and evaluation of solutions	2
	Total hours	30

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Lecture informative with elements of problem domains, supported by multimedia presentations and examples of solutions N2. Database management systems N3. E-learning system used for the publication of teaching materials and messages, and evaluate student work

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 – P01	PEK_U01	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F2 – P02	PEK_U02	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F3 – P03	PEK_U02	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F4 – P04	PEK_U02	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F5 – P05	PEK_U03	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F6 – P06	PEK_U03 PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F7 – P07	PEK_U03	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F8 – P08	PEK_U05	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F8 – P09	PEK_U05 PEK_U06	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F8 – P10	PEK_U07	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}

C

Test of students' knowledge and skills of the discussed topics on the lectures. Evaluation of the database project.

On the positive evaluation:

- The student should gain average grade from project and test at least **3.0** on the base of the following formula:

  p. < 8,0 -> 2.0
  8,0 ≤ p. < 9,5 -> 3.0
  9,5 ≤ p. < 11 -> 3.5
  11 ≤ p. < 12 -> 4.0
  12 ≤ p. < 13 -> 4.5
  13 ≤ p. ≤ 14 -> 5.0

- On the final test the student must solve at least 3 of the 5 tasks, and answer 2 out of 5 questions.

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Connolly T., Begg C., Database Systems. A Practical Approach to Design, Implementation, and Management 4th ed., Addison Wesley, 2005
[2] Celko J., SQL for Smarties. Advanced SQL Programming, 3th ed., Elsevier, 2005
[3] Elmasri R., Navathe S., Fundamentals of Database Systems 5th ed., Addison Wesley, 2007
[4] Kifer M., Bernstein A., Lewis P., Database Systems. An Application-Oriented Approach 2nd ed., Addison Wesley, 2006
[5] Lightstone S., Teorey T., Nadeau T., Physical Database Design, Elsevier 2007

SECONDARY LITERATURE:

[1] Ben-Gan I., Microsoft SQL Server 2008, T-SQL Fundamentals, Microsoft Press, 2009
[2] Hotek M., MCTS Training Kit: Microsoft SQL Server 2008 – Implementation and Maintenance, Microsoft Press, 2009
[3] The educational materials prepared by the teacher course on the basis of the documentation MS SQL, Oracle, and Internet resources

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……

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	K1INF_W07	C1	Lec 1, 2, 3, 4, 5	N1, N3
PEK_W02	K1INF_W07	C1	Lec 6	N1, N3
PEK_W03	K1INF_W07	C1	Lec 6	N1, N3
PEK_W04	K1INF_W016	C2	Lec 7, 8, 9	N1, N3
PEK_W05	K1INF_W016	C1	Lec 14	N1, N3
PEK_W06	K1INF_W016	C1	Lec 10, 11,12	N1, N3
PEK_W07	K1INF_W022	C1	Lec 12, 13	N1, N3
PEK_U01 (skills)	K1INF_U03, K1INF_U04	C1	Proj 2, 3, 4, 5, 6	N1, N2, N3
PEK_U02	K1INF_U04	C1, C2	Proj 7, 8	N1, N2, N3
PEK_U03	K1INF_U04	C1	Proj 9, 10, 11	N1, N2, N3
PEK_U04	K1INF_U16, K1INF_U19	C2	Proj 10, 12, 13	N1, N2, N3
PEK_U05	K1INF_U04, K1INF_U16, K1INF_U19	C1	Proj 9, 10, 12	N1, N2, N3
PEK_U06	K1INF_U09	C1, C2	Proj 9	N1, N2, N3
PEK_U07	K1INF_U03	C1	Proj 14	N1, N2, N3
…				
PEK_K01 (competences)				
PEK_K02				
…				

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY OF COMPUTER SCIENCE AND MANAGEMENT

SUBJECT CARD

Name in Polish: Sieci komputerowe

Name in English: Computer networks and communication

Main field of study (if applicable): Computer Science

Specialization (if applicable): ……..

Level and form of studies: 1st level, full-time

Kind of subject: obligatory

Subject code …….

Group of courses: 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		60		
Form of crediting	Examination		Crediting with grade		
For group of courses mark (X) final course					
Number of ECTS points	3		2		
including number of ECTS points for practical (P) classes			2		
including number of ECTS points for direct teacher-student contact (BK) classes	1,8		1,2		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Has a basic knowledge of linear algebra, analytic geometry and mathematical analysis, necessary for solving simple problems of an engineering calculation of technical and non-technical disciplines (K1INF_W01)
2. Has a basic knowledge of discrete mathematics, mathematical logic and mathematical statistics, the necessary information to solve simple engineering problems (K1INF_W02)
3. Has a basic knowledge of computer organization and architecture (K1INF_W08)
4. Has a basic knowledge of the design and operation of operating systems (K1INF_W10)
5. Can use indicated an analytical method and plan and carry out a simple experiment and computer simulation engineering, conduct a survey and analyze the results, particularly for the selected system components (K1INF_U09)
6. Knows the basic methods and tools for collecting, processing and retrieval of information

and to extract knowledge (K1INF_W16)

7. Can use the right tools to build a simple model of the process (the object), to formulate a specific task analysis and decision making (K1INF_U15)
8. Has the ability to self-education, including in order to improve professional competence (K1INF_U05)
9. Understands and knows the need continuous training opportunities and improving their social skills and (K1INF_K01)

SUBJECT OBJECTIVES

C1. Ordered, underpinned by theoretical knowledge in the field of taxonomy, structure and applications of computer networks, circuit switching and switching messages and tiered hierarchical models of computer networks, construction and functionality of network protocols, network protocols, rules of cooperation in piles according to protocols and analysis of quantitative and qualitative existing networks computer.

C2. Skills of analysis, design and configuration of network solutions using network models, standards and protocol stacks, formulation design and analysis tasks of network solutions and assess the suitability of a variety of networking solutions for the implementation of various services distributed systems.

C3. Skills for the selection of the appropriate variety of networking solutions to achieve business goals supported by IT systems.

SUBJECT EDUCATIONAL EFFECTS

Relating to knowledge:
K1INF_W11: Has basic knowledge of IT systems and computer networks
K1INF_W12: Has basic knowledge in the field of distributed systems architecture and methods for multiprocessor and distributed computing
K1INF_W14: Has basic knowledge of the architecture of the Internet and Web-based systems

Relating to skills:
K1INF_U05: Has the ability to self-study, including in order to improve the professional competence
K1INF_U06: Can choose the hardware and software components of a computer system for specific applications
K1INF_U08: Can configure basic network hardware and software in computer networks
K1INF_U11: Can obtain information from literature, databases and other sources, also in English, including for the purposes of self-education and improving professional skills, able to integrate the information, make their interpretation, as well as draw conclusions and formulate and justify opinions.

Relating to social competences:
K1INF_K01: Understands and knows the need for continuous training opportunities and improve their professional competence and social
K1INF_K04: He can appropriately prioritize for implementation specified by you or other tasks

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours**
Lec 1	Classification of computer networks	2
Lec 2	Circuit switching and message switching (packet switching). Evaluation of the effectiveness of resource use in networks with different switching methods. The optimal packet length (task fromulation). Classification of data communications traffic.	2
Lec 3	Connecting open systems model (Open Systems Interconnection model) and other models of computer networks	2
Lec 4	Layered network models and principles of cooperation between the layers	2
Lec 5	Open Systems Interconnection model layers – the physical layer	2
Lec 6	Medium access method in local and wide area networks, wired and wireless networks	2
Lec 7	Open Systems Interconnection model layers - the data link layer. Implementations of the data link layer functions in different network standards.	2
Lec 8	HDLC (High Level Data Link Control) protocol as an example of the connection in the data link layer	2
Lec 9	Open Systems Interconnection model layers - the network layer. Implementations of the network layer functions in different network standards.	2
Lec 10	Measures of the quality of services provided by networks serving streaming and elastic traffic. The tasks of routing and flow control	2
Lec 11	Node queuing model of packet-switched networks	2
Lec 12	IP (Internet Protocol) as an example of connectionless protocol at the network layer. Addressing issues in networks.	2
Lec 13	Congestions and congestion control tasks in packet switched networks.	2
Lec 14	TCP (Transport Control Protocol) as an example of protocol at the transport layer connection	2
Lec 15	Guidelines for the development of a network of circuit switched and packet switched. Concepts of providing the quality of services in computer networks. New generations of computer networks.	2
	Total hours	**30**

PROGRAMME CONTENT		
Form of classes - laboratory		**Number of hours**
Lab 1	Organizational Information.	2
Lab 2	Physical media, making the cables.	2
Lab 3	Communication over the network. Wired computers connections.	2

Lab 4	Using Wireshark™ to view and examine protocol data units. Application layer protocols.	2
Lab 5	IPv4 addressing. Packet Tracer. Network simulator.	2
Lab 6	Using Wireshark™ to view protocol data units. Network and transport layer protocols.	2
Lab 7	Establishing a console session with switch/router. Basic Cisco device configuration.	2
Lab 8	Basic Cisco device configuration part 2. Managing router and switch configuration. Password recovery procedure.	2
Lab 9	Final exam from Cisco CCNA (Cisco Certified Network Associate) Exploration semester 1	2
Lab 10	Creating VLAN (Virtual Local Area Network) network on switches. Connections between switches with trunk lines.	2
Lab 11	Managing the VLANs with VTP (Virtual Transfer Protocol) protocol	2
Lab 12	Basic static route configuration	2
Lab 13	Basic Inter-VLAN routing	2
Lab 14	Basic RIP (Routing Information Protocol) configuration	2
Lab 15	Exams Cisco CCNA (Cisco Certified Network Associate) Exploration. Grading.	2
	Total hours	**30**

TEACHING TOOLS USED
N1. Traditional lecture. Multimedia presentations.
N2. Student's own works – solving experiments and tasks in laboratory.
N3. Student's own works – literature studies.
N5. Collective works in laboratory
N5. Student's own works – preparation of presentations and technical documentations.

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 (lecture)	K1INF_W11 K1INF_W12 K1INF_W14 K1INF_U05 K1INF_U06 K1INF_U08 K1INF_U11	Observation of student's activity. Solving exercises. Preparation and presentation delivery.

	K1INF_K01 K1INF_K04	
F1 – F15 (laboratory)	K1INF_U05 K1INF_U06 K1INF_U08 K1INF_U11 K1INF_K01 K1INF_K04	Checking the preparation of the student. Checking the presence of the student. Observation of student activity. Observation and evaluation of student independence. Analysis of reports of exercise.
P (lecture)	K1INF_W11 K1INF_W12 K1INF_W14 K1INF_U05 K1INF_U06 K1INF_U08 K1INF_U11 K1INF_K01 K1INF_K04	Examination taking into account results of forming evaluation F1 (lecture)
P (laboratory)	K1INF_U05 K1INF_U06 K1INF_U08 K1INF_U11 K1INF_K01 K1INF_K04	Weighted sum of forming evaluations F1 – F15 (laboratory).

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] A.S. Tanenbaum, „Computer networks", Prentice Hall; 1996
[2] G. Pujolle, D. Seret, D. Dromard, E. Horlait, „Integrated Digital Communication Networks", J. Wiley & Sons
[3] B. Russell, „The art of computer networks", Prentice Hall; 2009
[4] V.S. Bagad, I.A. Dhotre, „Computer networks", Technical Publications, 2009.
[5] http://www.freebookcentre.net/Networking/Free-Computer-Networking-Books-Download.html
[6] M. Roden, „Analog and digital communication systems", Prentice Hall

SECONDARY LITERATURE:

[1] MIT open cources:http://ocw.mit.edu/courses/electrical-engineering-and-computer-science
[2] CCNA Exploration Network Fundamentals, Cisco Academy, PWN, 2008
[3] http://www.freebookcentre.net/Networking/Free-Computer-Networking-Books-Download.html

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Information and signals theory

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***	Program content***	Teaching tool number***
PEK_W01 (knowledge)	K1INF_W11	C1,C3	Lec 1 – Lec 15	N1, N2, N3
PEK_W02	K1INF_W12	C1, C2	Lec 1 – Lec 15	N1, N2, N3
PEK_W03	K1INF_W14	C1, C3	Lec 1 – Lec 15	N1, N2, N3
PEK_U01 (skills)	K1INF_U05	C2	Lab 1 – Lab 15	N2, N4, N5
PEK_U02	K1INF_U06	C2	Lab 1 – Lab 15	N2, N4, N5
PEK_U03	K1INF_U08	C2	Lab 1 – Lab 15	N2, N4, N5
PEK_U04	K1INF_U11	C1, C2, C3	Lec 1 – Lec 15 Lab 1 – Lab 15	N1, N2, N3, N4, N5
PEK_K01 (competences)	K1INF_K01	C1, C2, C3	Lec 1 – Lec 15 Lab 1 – Lab 15	N1, N2, N3, N4, N5
PEK_K02	K1INF_K04	C1, C2, C3	Lec 1 – Lec 15 Lab 1 – Lab 15	N1, N2, N3, N4, N5

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

Zał. nr 4 do ZW 64/2012

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish Analiza systemowa i metody wspomagania podejmowania decyzji w Informatyce

Name in English Systems analysis and decision support methods in Computer Science

Main field of study (if applicable): Computer Science

Specialization (if applicable): ……..

Level and form of studies: 1st/ ~~2nd~~* level, full-time / ~~part-time~~*

Kind of subject: obligatory / ~~optional~~ / ~~university-wide~~*

Subject code INZ 000000

Group of courses ~~YES~~ / NO*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	15	15		
Number of hours of total student workload (CNPS)	90	30	30		
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					
Number of ECTS points	**3**	1	1		
including number of ECTS points for practical (P) classes	0	0	1		
including number of ECTS points for direct teacher-student contact (BK) classes	1,8	0,6	0,6		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge about description of dynamic processes with use of differential equations and transfer function (*K1INF _W15* Student has elementary knowledge in the fields of modelling processes with different nature and knows methods and techniques for decision support systems)
2. Knowledge about mathematical analysis (*K1INF_U15* Student is capable, using different computer tools, to describe and to analyse simple object and formulate decision making task for such object and he/she can propose method of solution)
3. Knowledge about OSH (*K1INF _U14* Student complies with occupational safety and health)

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SUBJECT OBJECTIVES

C1 Acquisition of skills to create mathematical models of technical and non-technical processes.
C2 Learn how to formulate typical decision making problems and how to solve them .
C3 Acquisition of skills to apply computer methods for decision making support.

SUBJECT EDUCATIONAL EFFECTS

related to knowledge:

PEK_W01 Knowledge of modern techniques of modelling and analysis of dynamical processes.

PEK_W02 Knowledge of generic decision making problems in computer science.

related to skills:

PEK_U01 Knows how to apply rules of using class room and laboratory.

PEK_U02 Knows how to apply system analysis in scientific and engineering problems.

PEK_U02 Knows how to use MATLAB and SIMULINK for engineering computations, in particular for modelling and optimization.

related to social competences:

PEK_K01 Knows how to present results of its works in clear way.

PEK_K02 Knows modern methods of dynamical processes analysis, comprehends the need for new solutions and his/her knowledge improvement

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Model in systems research. Introduction – basic concept.	1
Lec 2	Continuous signal, the Laplace transforms.	1
Lec 3	Discrete signal, Z transforms.	1
Lec 4	Typical plant models – relations between descriptions.	1
Lec 5	Elementary linear elements.	1
Lec 6	Model building task based on experiment – identification problem .	1
Lec 7	Identification of static plant. Deterministic problem – determination of the plant parameters.	1
Lec 8	Noised measurements of the physical variables.	1
Lec 9	Estimation of plant parameters with noisy measurements.	1
Lec 10	Choice of the best model – probabilistic case. Regression functions.	1
Lec 11	Determination of the regression functions based on the experimental data.	1
Lec 12	Model based decision making (acceptable, satisfactory and optimal decisions).	1
Lec 13	Analytical methods of unconstrained optimization for multivariable functions.	1
Lec 14	Analytical methods of constraint optimization for multivariable functions.	2
Lec 15	Discrete optimization – branch and bound algorithm.	1
Lec 16	Linear programming.	1
Lec 17	Numerical optimization methods - basic concepts. Numerical optimization methods for one variable function.	1
Lec 18	Pattern search optimization.	2
Lec 19	Gradient based optimization methods.	1
Lec 20	Methods for probabilistic optimization problems: Monte Carlo method,	2

	evolutionary and genetic algorithms, simulating annealing.	
Lec 21	Multi-criteria optimization.	1
Lec 22	Pattern recognition algorithms for decision making support.	2
Lec 23	Multi-stage decision making, dynamical programming.	1
Lec 24	Decision making in uncertain conditions.	1
Lec 25	Game theory in decision making.	2
	Total number of hours	30

Form of classes - class		**Number of hours**
Cl 1	Examples of dynamical processes and their models.	1
Cl 2	Differential equations, Laplace's transform and transfer function.	1
Cl 3	Solving differential equations with use of the Laplace transform.	1
Cl 4	Discrete processes examples and their models. The Z Transform.	1
Cl 5	Solving difference equations.	1
Cl 6	Numerical methods of solving differential equations. Euler's scheme, mid-point method and Runge-Kutta methods.	1
Cl 7	Optimization problems formulations. Decision variables, performance index, constraints.	2
Cl 8	Foundations of optimization. Convex sets and functions, quadratic form, gradient, the Hessian matrix.	1
Cl 9	Analytical methods for unconstrained and constrained optimization. Equality constraints and the Lagrange function.	1
Cl 10	Analytical methods for unconstrained and constrained optimization. Inequality constraints and Kuhn-Tucker conditions.	1
Cl 11	Linear programming.	1
Cl 12	Integer programming.	1
Cl 13	Dynamical programming.	2
	Total number of hours.	15

Form of classes - laboratory		**Number of hours**
Lab 1	Instructions for OSH. Introduction for MATLAB. Basic commands, working with command window.	1
Lab 2	Advanced functions in MATLAB for data processing. Graphical User Interface.	1
Lab 3	Dynamical processes modeling in Simulink. Difference equations and transfer function. Solving difference equations.	2
Lab 4	Fundamental classes of dynamical processes. Simulation studies.	1
Lab 5	Building model and simulation of selected dynamical process. Report.	1
Lab 6	Optimization method for one variable function. Implementation and graphical presentation of selected methods.	2
Lab 7	Optimization method for multi variable function. Implementation and graphical presentation of selected methods. Report.	3
Lab 8	Application of Matlab's toolbox for advanced problems of modeling and optimization.	2

Lab 9	Elaboration of student's own project in Matlab environment. Report.	2
	Total hours	15

Form of classes - project		**Number of hours**
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem 1		
Sem 2		
…		
	Total number of hours	

TEACHING TOOLS USED

N1. Traditional lecture. Multimedia presentations.
N2. Student's own works – solving calculation tasks.
N3. Collective works.
N4. Student's own works – literature studies.
N5. Student's own works – programming Matlab and Simulink.
N6. Student's own works – simulation studies.
N7. Student's own works – results presentation.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end)	Educational effect number	The way of evaluating educational effect achievements
F1 – F5	PEK_U01 – PEK_U03 PEK_K01 – PEK_K02	Observation of student's activity. Solving exercises. Conversation with student about current laboratory exercises. Report evaluation.
F6 – F9	PEK_U01 – PEK_U03 PEK_K01 – PEK_K02	Observation of student's activity. Solving exercises. Conversation with student about current laboratory exercises. Report evaluation.
F10 – F13	PEK_U01 – PEK_U03 PEK_K01 – PEK_K02	Observation of student's activity. Solving exercises. Conversation with student about current laboratory exercises. Report evaluation.
P1 (Lec)	PEK_W01 – PEK_W02	Examination
P2 (Cl)	PEK_U02,	F1 – F13

	PEK_K02	
P3 (La)	PEK_U01 – PEK_U03 PEK_K01 – PEK_K02	F1 – F13

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Bubnicki Z., *Identification of control plants*, PWN, Warszawa, 1980.
[2] Bubnicki Z. *Modern Control Theory*, Springer, Berlin-Heidelberg-New York, 2005
[3] Ikonen E., Najim K.*, Advanced identification and control*, CRC Press LLC, 2002

SECONDARY LITERATURE:

[1] Bazaraa M. S., Sherali H.D., Shett C. M., *Nonlinear Programming Theory and Algorithms*, John Wiley and Sons, Inc., 2006
[2] Chong E.K.P., Żak S.H., *An Introduction to Optimization*, Wiley-Interscience, 2008.
[3] Ogata K., *Modern Control Engineering*, Prentice Hall, 2009.

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……

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 (knowledge)	K1INF_W15	C1	Lec1-Lec20	N1
PEK_W02	K1INF_W15	C1,C2	Lec7, Lec10, Lec11, Lec12,Lec17–Lec20 Cl7	N1,N2, N3
PEK_U01 (skills)	K1INF_U14	C1,C2	C1 – C13, La1 – La9	N2, N3, N5
PEK_U02	K1INF_U15	C1,C2	La3 – La7 Cl1 – Cl13	N2, N3, N4, N6
PEK_U03	K1INF_U15	C3	La1 – La9	N5, N6
PEK_K01 (competences)	K1INF_U15	C3	La5 – La7	N7
PEK_K02	K1INF_U15	C1,C2, C3	Lec1 – Lec15	N1, N4

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

*** - from table above

FACULTY W-8 / DEPARTMENT Informatics……

SUBJECT CARD

Name in Polish Systemy Operacyjne…….
Name in English Operating Systems…….
Main field of study (if applicable): …….
Specialization (if applicable): ……..
Level and form of studies: 1st level, full-time
Kind of subject: obligatory
Subject code …GK 20200…….
Group of courses YES

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15		30		
Number of hours of total student workload (CNPS)	60		60		
Form of crediting	crediting with grade		crediting with grade		
For group of courses mark (X) final course					
Number of ECTS points	3		3		
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes					

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of computer systems
2. Basic knowledge of programming languages

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SUBJECT OBJECTIVES

C1 Students possess knowledge of theorethical and practical aspects of operating systems
C2 Students possess practical skills of programming at shell level and system functions level in Linux operating system environment

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 students know the general principles of using operating systems
PEK_W02 students know the general principles of programming in the LINUX
PEK_W03 students know the basic functions of operating system Linux, enabling to create system software in C language
relating to skills:
PEK_U01 students have the skill of self learning in the aim of the lifting professional skills
PEK_U02 students are able to gain information from various sources
PEK_U03 students are able to define software problems, and then finding solution, using suitable programming tools
relating to social competences:
PEK_K01 students understand the need of continous education

PROGRAMME CONTENT		
Form of classes - lecture		**Number of Hours**
Lec 1	Operating system organization, structures and functions	2
Lec 2	Evolving of operating systems, different classes of operating systems	2
Lec 3	Memory organization and management, file systems	2
Lec 4	Process management	2
Lec 5	Interprocess Communications	2
Lab 6	System programming in Linux operating system	2
Lec 7	Operating systems in Network environment	2
Lec 8	Case study of selected operating system	1
	Total hours	15
Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	
Form of classes - laboratory		**Number of hours**
Lab1	Introduction to work in Linux operating system	2
Lab2	Creation of user environment	2
Lab3	Selected system commands	2
Lab4	Operations on files and directories	4
Lab5	Programming in Bash command interpreter	4
Lab6	Text data processing (grep, awk)	4
Lab7	Processes in operating system – creation, mechanism of fork/exec	6
Lab8	Interprocess Communications in Linux	6
	Total hours	30
Form of classes - project		**Number of hours**
Proj1		
Proj2		
Proj3		
Proj4		
…		
	Total hours	
Form of classes - seminar		**Number of hours**
Sem1		
Sem2		

Sem3		
…		
	Total hours	

TEACHING TOOLS USED
N1. The lecture – the traditional method N2. Consultations N3. Practical exercises at computer laboratory

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 Laboratory		Presentation of programming work, oral explanation
F2 Laboratory		Presentation of programming work, oral explanation
P Lecture		Final test
C		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Silberschatz A., Operating System Concepts, Addison-Wesley, 2005
[2] Stallings W., Operating Systems: Internal and Design Principles, Inc. Pearson Prentice Hall, 2005
[3] Nutt G., Operating Systems, Pearson Education, 2004
[4]

SECONDARY LITERATURE:

[1] Jay A., Burns T., Unix Shell Programming,Wiley & Sons, 1998
[2] Love R., Linux System Programming, O'Reilly Media, 2007
[3]

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Operating Systems

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 (knowledge)	K1INF_W10	C1, C2	Lec 1-4	N 1-3
PEK_W02	K1INF_04, K1INF_10	C1, C2	Lec 4-7	N 1-3
PEK_W03	K1INF_10	C1, C2	Lec 4-7	N 1-3
PEK_U01 (skills)	K1INF_U04, K1INF_U05	C2	Lec 1-8	N 1-3
PEK_U02	K1INF_U05, K1INF_U11	C1, C2	Lec 1-8	N 1-3
PEK_U03	K1INF_U12, K1INF_U14	C1, C2	Lec 1-8	N 1-3
PEK_K01 (competences)	K1INF_K01, K1INF_U05	C1, C2	Lec 1-8	N 1-3
PEK_K02				

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY W-8/ DEPARTMENT……

SUBJECT CARD

Name in Polish: Informatyczne systemy sterowania
Name in English: Computer Control Systems
Main field of study (if applicable): Informatyka
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		30	15	
Number of hours of total student workload (CNPS)	30		90	30	
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					
Number of ECTS points	2		2	1	
including number of ECTS points for practical (P) classes	0		2	1	
including number of ECTS points for direct teacher-student contact (BK) classes	1,2		1,2	0,6	

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge on functions of computer's main components and registers.
2. Knowledge on functions of operating systems and on structure and operation principles of PC computers operating systems.
3. Knowledge on Ethernet local area network communication protocol.
4. Knowledge on how process dynamics can be modeled using a differential equation or a transfer function.

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SUBJECT OBJECTIVES

C1 Acquiring basic knowledge on problems, methods and technologies of industrial process control – as a main implementation area for real-time computer systems.

C2 Acquiring skills in developing computer systems supporting simple control tasks, in particular – skills in setting up and configuring equipment as well as in designing and implementing control algorithms, user's interfaces and communication procedures in distributed environments.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Student can characterize typical structures of control systems.

PEK_W02 Student can formulate a stabilization problem and present a selected stabilization algorithm in a closed-loop system.

PEK_W03 Student knows definitions and examples of real-time systems, and the SFC method for modeling transitions in event systems, is able to present architecture and operation principles of a selected real-time operating system.

PEK_W04 Student can characterize equipment of computer control systems, in particular – can describe architecture, operation principle and programming languages of PLCs as well as describe PLCs' properties specific to real-time systems.

PEK_W05 Student is able to describe a selected communication mechanism of distributed computer control systems and explain its important real-time properties in comparison to a selected communication mechanism of distributed computer systems with no real-time requirements.

relating to skills:

PEK_U01 Student follows rules for using laboratory equipment.

PEK_U02 Student is capable of applying a dedicated software to perform simulation of a control algorithm and analyze the results.

PEK_U03 Student is capable of implementing interface to a control system, in a form of synoptic table/operator's panel, and implement it using SCADA software.

PEK_U04 Student is capable of configuring and programming PLC, and of calculating its cycle time.

PEK_U05 Student is able to connect and configure component devices of a distributed computer control system and implement communication between them over an industrial network.

PEK_U06 Student is able to specify control tasks, to select components of a computer control system, to recommend control algorithms as well as technologies for process data collection and visualization – based on user's requirements expressed verbally.

relating to social competences:

PEK_K01 Student is familiar with current trends in technological development of computer control systems, understands the need for learning new solutions and minimizing costs.

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec1	Introduction. Control problem, control system, typical structures of control systems.	1
Lec2, Lec3	Closed-loop control. Stability. Closed-loop control algorithms.	3
Lec3, Lec4	Real-time systems and control systems. Real-time operating systems.	3
Lec5	Hierarchical structure of a distributed computer control system.	1
Lec5, Lec6	Programmable controllers PLC.	3
Lec7	Industrial computer networks.	2

Lec8	Sensors and A/C, C/A converters.	2
	Total hours	15

Form of classes - class		Number of hours
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		Number of hours
Lab1	Explaining safety rules (BHP training). Introduction.	1
Lab1 – Lab6	Using SCADA software – defining variables, downloading process data, data visualization and manual control with operators panel.	11
Lab7 – Lab11	Using MATLAB/Simulink software for simulation, analysis and design of control algorithms.	10
Lab12 – Lab15	Data exchange technologies in control systems. Linking SCADA and Matlab software environments. Using OPC software tools.	8
	Total hours	30

Form of classes - project		Number of hours
Proj1	Introduction. Familiarization with PLC structure and software development packages for Windows.	1
Proj2 – Proj4	Implementing LOGO! PLC control programs and S7-200 PLC control programs for control tasks specified by a teacher. Setting up and putting in operation the corresponding control systems developed by individual students.	6
Proj5 – Proj8	Design, implementation, setting up and putting in operation of distributed control systems developed by student teams.	7
Proj8	Presentations of the developed control systems.	1
	Total hours	15

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Traditional lecture.
N2. Students individual work – solving computational exercises.
N3. Group work – discussion, conversation with an individual student.
N4. Students individual work – programming.
N5. Students individual work – performing computer simulations.
N6. Students individual work – studying literature.
N7. Students individual work – analyzing, designing.
N8. Students individual work – presenting.
N9. Students individual work – setting up and configuring devices..

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 – F4	PEK_U01, PEK_U03	Watching students actions. Short (ca. 4 min) conversations with individual students concerning current laboratory exercises (incl. presentation of computer programs, computed results and conclusions), a report.
F5 – F8	PEK_U01, PEK_U02	Watching students actions Short (ca. 4 min) conversations with individual students concerning current laboratory exercises (incl. presentation of computer programs, computed results and conclusions), a report.
F9 – F10	PEK_U01, PEK_U02, PEK_U03	Watching students actions. Short (ca. 4 min) conversations with individual students concerning current laboratory exercises (incl. presentation of computer programs, computed results and conclusions), a report.
F11, F12	PEK_U01, PEK_U04	Watching students actions. Short (ca. 4 min) conversations with individual students concerning current laboratory exercises (incl. presentation of computer programs, computed results and conclusions), a report.
F13	PEK_U05, PEK_U06	On the basis of: conversations on current effects of project works, a report, a presentation.
P1 (Lec)	PEK_W01 – PEK_W05	Written examination.
P2 (Lab)	PEK_U01, PEK_U02, PEK_U03	F1 – F10
P3 (Proj)	PEK_U01, PEK_U04,	F11 – F13

	PEK_U05, PEK_U06	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Users' manuals and programmers' guides for PLC LOGO! and PLC S7-200 (available on-line)
[2] Wonderware InTouch - users' manual (available on-line)

SECONDARY LITERATURE:

[1] Bubnicki Z.: *Modern control theory*, Springer Verlag, Heidelberg-Oxford-N. York, 2005.

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Computer Control Systems

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Informatyka

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 (knowledge)	K1INF_W15	C1	Lec1	N1
PEK_W02	K1INF_W15, K1INF_W21 K1INF_U05	C1	Lec2, Lec3	N1
PEK_W03	K1INF_W10, K1INF_W21 K1INF_U05	C1	Lec3, Lec4	N1
PEK_W04	K1INF_W08, K1INF_W21 K1INF_U05	C1	Lec5, Lec6, Lec8	N1
PEK_W05	K1INF_W11, K1INF_W21	C1	Lec5, Lec7	N1
PEK_U01 (skills)	K1INF_U14	C2	Lab1 – Lab15, Proj1 – Proj8	N1, N3, N9
PEK_U02	K1INF_U05, K1INF_U14, K1INF_U15	C2	Lab7 – Lab15	N3, N4, N5, N6, N7
PEK_U03	K1INF_U05, K1INF_U06, K1INF_U14, K1INF_U15, K1INF_U18	C2	Lab1 – Lab6, Lab12 – Lab15 Proj5 – Proj8	N3, N4, N6, N7
PEK_U04	K1INF_U05, K1INF_U14, K1INF_U18	C2	Lec6, Proj1 – Proj8	N1, N2, N3, N4, N6, N9
PEK_U05	K1INF_U05, K1INF_U08, K1INF_U14, K1INF_U18	C2	Lec6, Lec7, Proj1 – Proj8	N1, N3, N4, N6, N9
PEK_U06	K1INF_U05, K1INF_U06, K1INF_U13, K1INF_U15, K1INF_U18	C2	Lec2, Lec3, Lec5 – Lec8, Lab1 – Lab6, Proj5 – Proj8	N1, N3, N4, N6, N7, N8, N9
PEK_K01 (competences)	K1INF_K01, K1INF_K02	C1, C2	Lec2 – Lec8, Proj5 – Proj8	N1, N3, N6, N7

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

*** - from table above

FACULTY Computer Science and Management / DEPARTMENT Informatics

SUBJECT CARD

Name in Polish …Zarządzanie projektem informatycznym…….
Name in English …Software Project Management …….
Main field of study (if applicable): Computer Science
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)	2		1		
Number of hours of total student workload (CNPS)	60		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		2		
including number of ECTS points for practical (P) classes			2		
including number of ECTS points for direct teacher-student contact (BK) classes	1,2		1,2		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. students are expected to be familiar with the material covered in software engineering course

\

SUBJECT OBJECTIVES

C1 To develop an awareness of the need for project planning and management
C2 To apply professional attitudes and techniques to managing a project

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Explain the stages in the project development lifecycle; explain of key components of a project plan
PEK_W02 Demonstrate an understanding of steps needed to build and maintain effective development teams
PEK_W03 Explain the procedures needed to monitor, control and report upon an IT development project
PEK_W04 Explain the ways in which appropriate quality attributes of the products of an IT development project can be assessed and assured

…

relating to skills:

PEK_U01 demonstrate an ability to prepare a project charter of simple project
PEK_U02 apply basic project planning techniques and to assign resources to project tasks
PEK_U03 apply basic project cost estimation techniques

relating to social competences:
PEK_K01 understand how to work as team member and as individual without affecting the quality of project; understanding of steps needed to build and maintain effective development teams
PEK_K02 understanding where apply the principles of project risk management

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Basic notions in project management. Feasibility study	2
Lec 2	Project planning and scheduling techniques for plan driven methods	2
Lec 3	Project planning and scheduling techniques for agile driven methods	2
Lec 4	Project resources. Project risk. Project cost estimation	3
Lec 5	Team management (organization and decision-making, roles and responsibilities in a software team).	3
Lec 6	Communication in project	2
Lec 7	Project tracking and progress monitoring	1
Lec 8	Software quality.	2
Lec 9	Process quality. ISO and SEI quality standards	2
Lec 10	Software Quality Assurance methods and techniques	2
Lec 11	Tools for project management	2
Lec 12&13	Methodologies of software project management- review (PRINCE2,DSDM,Scrum.)	4
Lec 14	Software Implementation and deployment projects	2
Lec 15	Test	1
	Total hours	30

Form of classes - class		Number of hours
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		Number of hours
Lab 1	Introductory lab: safety regulation; introduction to MSProject 2010.	1
Lab 2	Project scope definition; requirements specification.	2
Lab 3	Traditional project planning and scheduling	2
Lab 4	Agile project planning and scheduling	2
Lab 5	Project Resource definition and assignments	2
Lab 6	Project cost estimation; project task tracking	4

Lab7	Summary-Reporting project planning results	2
	Total hours	15

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
Sem 4		
….		
	Total hours	

TEACHING TOOLS USED

N1. Informative lectures supporting with PowerPoint presentations
N2. Software for software project management
N3. Examples of managerial documentation of projects published on e-learning system

EVALUATION OF SUBJECT EDUCATI ONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1	**PEK_U01- PEK_U03**	Grades based on completeness, on time and quality of laboratory assignments
F2	**PEK_W01- PEK_W04**	Grade based on multichoice test result

C
Grading Scale
- final grade will be based on the following scale: A=100-93; B=92-85; C=84-77; D=76-70; F=69-0;
Final course grade will be based upon the following weights for categories of assessments:

- Weekly course participation 10%
- laboratory assignments 40%
- final test 50%

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Kenneth R. Bainey. Integrated IT Project Management: A Model-Centric Approach. Artech House. –2004. - 502p

[2] Paul E Harris. Planning and Control Using Microsoft® Project and PMBOK® Guide Third Edition. Eastwood Harris Pty Ltd. – 2005. – 300 p

[3] Robert K. Wysocki and Rudd McGary, "Effective Project Management", 3rd edition,Wiley

[4] E-Book – Project Management Body of Knowledge

SECONDARY LITERATURE:

[1]
[2]
[3]

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Software Project Management

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science

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 (knowledge)	K1INF **_W18**	C1	Lec 1-4, Lec 7-10,14	N1,N3
PEK_W02	K1INF **_W18**	C1,C2	Lec5	N1,N3
PEK_W03	K1INF **_W18**	C1,C2	Lec 6, Lec 7, Lec 12-13	N1,N2,N3
PEK_W04	K1INF **_W18**	C1,C2	Lec 8- 11	
PEK_U01 (skills)	K1INF **_U14,** K1INF **_U10**	C2	Lab1,Lab2,	N2,N3
PEK_U02	K1INF **_U10**	C2	Lab3,lab4	N2,N3
PEK_U03	K1INF **_U10**	C2	Lab5,lab6	N2,N3
PEK_K01 (competences)	K1INF **_K02**	C1	Lec5, Lec 6	N1,N3
PEK_K02	K1INF **_K02**	C1	Lec 4-7	N1,N3

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

*** - from table above

FACULTY Computer Science and Management / DEPARTMENT Informatics

SUBJECT CARD

Name in Polish …Techniki w zarządzaniu projektem informatycznym…….
Name in English …Software Project Management Techniques…….
Main field of study (if applicable): Computer Science
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)	1		1		1
Number of hours of total student workload (CNPS)	30		60		30
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	1		2		1
including number of ECTS points for practical (P) classes			2		
including number of ECTS points for direct teacher-student contact (BK) classes	0,6		1,2		0,6

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. students are expected to be familiar with the material covered in software engineering course

\

SUBJECT OBJECTIVES

C1 To develop an awareness of the need for project planning and management
C2 To apply professional attitudes and techniques to managing a project

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Explain the stages in the project development lifecycle; explain of key components of a project plan
PEK_W02 Understanding of steps needed to build a project plan
PEK_W03 Explain the procedures needed to monitor, control and report upon an IT development project
…

relating to skills:

PEK_U01 demonstrate an ability to prepare a project charter of simple project
PEK_U02 apply basic project planning techniques and resource assigning to project tasks
PEK_U03 apply basic project cost estimation techniques

PEK_U04 demonstrate ability to prepare a presentation and essay on given subject
…
relating to social competences:
PEK_K01 working as project a manager in planning and cost estimation project areas;
PEK_K02 understanding of steps needed to build and maintain effective development teams

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Basic notions in project management. Feasibility study	1
Lec 2	Project planning and scheduling techniques for plan driven methods	2
Lec3	Project planning and scheduling techniques for agile driven methods	2
Lec 4	Project resources-;examples. Team management (organization and decision-making, roles and responsibilities in a software team).	2
Lec 5	Project cost estimation techniques	2
Lec 6	Project monitoring and tracking.	1
Lec 7	Software quality. Software Quality Assurance methods and techniques.	2
Lec 8	Methodologies of software project management- review (PRINCE2,DSDM,Scrum..)	2
Lec 9	Test	1
	Total hours	15

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		**Number of hours**
Lab 1	Introductory lab: safety regulation; introduction to MSProject 2010.	1
Lab 2	Project scope definition; requirements specification.	2
Lab 3	Traditional project planning and scheduling	2
Lab 4	Agile project planning and scheduling	2
Lab 5	Project Resource definition and assignments	2
Lab 6	Project cost estimation; project task tracking	2
Lab7	Summary-Reporting project planning results	2
	Total hours	15

Form of classes – project	**Number of hour**

		s
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem 1	Introductory seminar; topics assignments	1
Sem 2	Conceptualizing and Initializing the IT Project; Developing the Project Charter	2
Sem 3	Developing the Project Plan and Schedule; Resource problems	2
Sem 4	The Human Side of Project Management	2
Sem 5	Managing Change, Resistance and Conflicts	2
Sem 6	Progress monitoring, project control and reporting	2
Sem 7	Software quality	2
	Total hours	15

TEACHING TOOLS USED

N1. Informative lecture supporting with PowerPoint presentations
N2. software application for software project management
N3. Examples of managerial documentation of projects published on e-learning system

EVALUATION OF SUBJECT EDUCATI ONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1	**PEK_U04**	Grade based on student participation in discussion, prepared MsPowerPoint presentation and essay
F2	**PEK_U01- PEK_U03**	Grades based on completeness, on time and quality of laboratory assignments
F3	**PEK_W01- PEK_W04**	Grade based on multichoice test result

C

Grading Scale

- final grade will be based on the following scale: A=100-93; B=92-85; C=84-77; D=76-70; F=69-0;

Final course grade will be based upon the following weights for categories of assessments:

- Discussion forums and weekly course participation 10%
- Presentation and essay 20%
- laboratory assignments 40%
- final test 30%

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Kenneth R. Bainey. Integrated IT Project Management: A Model-Centric Approach. Artech House. –2004. - 502p

[2] Paul E Harris. Planning and Control Using Microsoft® Project and PMBOK® Guide Third Edition. Eastwood Harris Pty Ltd. – 2005. – 300 p

[3] Robert K. Wysocki and Rudd McGary, "Effective Project Management", 3rd edition,Wiley

[4] E-Book – Project Management Body of Knowledge

SECONDARY LITERATURE:

[1]
[2]
[3]

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

Iwona Dubielewicz, iwona.dubielewicz@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Software Project Management Techniques

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science

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 (knowledge)	K1INF _**W18**	C1,	Lec1,lec2,lec3	N1,N3
PEK_W02	K1INF _**W18**	C2	Lec2-5,Lec 8	N1,N3
PEK_W03	K1INF _**W18**	C2	Lec6,lec7	N1,N3
PEK_U01 (skills)	K1INF _**U14,** K1INF _**U10**	C2	Lab1,Lab2,	N2,N3
PEK_U02	K1INF _**U10**	C2	Lab3,lab4	N2,N3
PEK_U03	K1INF _**U10**	C2	Lab5,lab6	N2,N3
PEK_U04	K1INF _**U10**	C2	Sem2-7, lab7	N1
PEK_K01 (competences)	K1INF _**K02**	C1	Lec2-6, lab2-6 sem 2-7	N1,N3
PEK_K02	K1INF _**K02**	C1	Lec 4,8	N1,N3

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

*** - from table above

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish Systemy multimedialne
Name in English Multimedia Information Systems
Main field of study (if applicable): IT
Specialization (if applicable):
Level and form of studies: 1st/ ~~2nd~~* level, full-time / part-time*
Kind of subject: ~~obligatory~~ / optional / ~~university-wide~~*
Subject code INZ000147Wl
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)	60		90		
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					
Number of ECTS points	2		3		
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes	1,0		2,0		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of object-oriented programming.
2. Basic knowledge of computer application interface design.
3. Elementary knowledge of graphics programs.

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SUBJECT OBJECTIVES

C1 Provide basic knowledge of the design of multimedia applications.
C2 Learning programming multimedia applications in Adobe Flash and HTML5.
C3 Presentation graphics software.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 He knows and understands multimedia applications specific.

PEK_Wo2 Has knowledge of the design and development of multimedia applications.

PEK_W03 Has knowledge of software tools for processing and multimedia creation.

relating to skills:

PEK_U01 Able to define a set of potential functional requirements of multimedia applications and, based on this set, can design a multimedia application.

PEK_U02 He can build a multimedia application.

PEK_U02 He can convert and generate media.

relating to social competences:

PEK_K01 Able to work with a potential user of multimedia application in order to define the set of possible functional requirements.

PEK_K02 It can take into account in the design process of mobile application interface specific requirements of a potential user.

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	The presentation of the lecture plan. A review of selected multimedia applications implemented in different runtime environments. Presentation of Adobe Flash Environment. Demonstration of constructing multimedia applications in Adobe Flash.	2
Lec 2	Presentation of the basic elements of the Adobe Flash. Presentation of the principles of design and multimedia applications run in Adobe Flash. Programming mechanisms of interaction.	2
Lec 3 Lec 4	Grammar describes the basics of ActionScript 3.0. Presentation and discussion of selected examples of programs in ActionScript 3.0.	4
Lec 5	Analysis of complex mechanisms of interaction and navigation multimedia application. Presentation of the AS 3.0 code fragments implementing mechanisms of navigation.	2
Lec 6 Lec 7	A review of selected media data compression formats. Presentation methods of media management in Adobe Flash CS6 from the timeline and ActionScript 3.0. Discussion of mechanisms for streaming media data, and methods for working with audio and video. Presentation and analysis of the source code for multimedia applications using audio and video. Overview of multimedia application design principles of the peculiarities of the target group, the platform runtime and lifetime of the application.	4
Lec 8	Describes the basics of computer animation. Discussion of the animation in the timeline and animation implemented in AS 3.0. Presentation of the arrangements for using the motion editor panel (Motion Editor). Explanation idea of inverse kinematics and transformations.	2
Lec 9	Overview and characteristics of programming environments used for multimedia processing components of multimedia applications. Describes the basics of using Photoshop. Presentation 3ds Max Design. Discussion of the principles of cooperation Photoshop and 3ds Max Design with the Adobe Flash environment.	2
Lec 10	Discussion of the principles of design and construction of multimedia mobile applications in Adobe Flash. Presentation and discussion of program code in AS	2

	3.0, dedicated mobile platforms.	
Lec 11 Lec 12	Presentation environments alternatives to Adobe Flash for example, Adobe Director, Microsoft Silverlight and HTML5. Describes the basics of grammar HTML5. Overview of HTML5 canvas elements. Presentation of the principles API canvas elements. Discussion of the principles of working with images and video clips. Discussion of the principles of animation and interaction with the elements of the canvas. Presentation and discussion of the code sample programs implemented in HTML5.	4
Lec 13 Lec 14	Discussion of the principles of the use of 3D graphics for multimedia applications. Presentation and discussion of the example design and animation of 3D objects in the environment 3ds Max Design. Creating and managing objects in a 3D environment in Adobe Flash. Discussion environments support the creation of 3D graphics in AS 3.0. The presentation the possibility Papervision and Away3D environments. Presentation and discussion of the principles of combining components Papervision and Away3D with native code multimedia applications in AS 3.0.	4
Lec 15	Summary of the lecture. Discuss the importance of mobile multimedia applications. Discussion of factors affecting the commercial success of a multimedia application.	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		**Number of hours**
Lab 1	Presentation of the principles of operation of the laboratory and the principles of assessment. Basic use of the Adobe Flash environment. How to use the GUI tools. Animations in the timeline.	2
Lab 2	Defining symbols: buttons, movie clip and graphic. The implementation of the mechanisms of interaction. Importing multimedia components to the working environment.	2
Lab 3	An interactive gallery of photos from the alpha channel animation in the timeline (in the form of movie clips). Construction applications on multiple layers. Interaction and animation in AS 3.0.	2
Lab 4	Design interactive photo gallery with exciting animation and sound. Coding in AS 3.0. Downloading multimedia components from the application library.	2
Lab 5	Construction of the complex mechanisms, interactive animation in AS 3.0.	2
Lab 6	Constructing an application that retrieves multimedia components from external sources (from the indicated storage location) in AS 3.0.	2
Lab 7	Constructing sound management of multimedia applications and video in AS 3.0. Implementation of the built-in mechanisms audio and video.	2
Lab 8	Using the motion editor panel (Motion Editor). Preparing an animated banner using motion editor.	2
Lab 9	Designing a 3D object model and implementation of animation in 3ds Max Design environment.	2
Lab 10	Designing complex 3D object in the 3ds Max Design. The implementation of a set	4

Lab 11	of animation movements between selected points 3d object. Export animation to Adobe Flash. Programming navigation mechanism in AS 3.0.	
Lab 12	Implementation interactive animation in HTML5.	2
Lab 13 Lab 14	Designing a multimedia e-learning applications (with elements of interactive tests), implementation in AS 3.0, running and testing of the tablet with Android.	4
Lab 15	Summary laboratory. Credit lab.	2
	Total hours	30

Form of classes - project		**Number of hours**
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lectures in the form of multimedia presentations.
N2. Introduction to laboratory prepared in the form of a multimedia presentation that contains the specification of the tasks and detailed, documented and contain comments sections of code, useful for the task. Materials sent by e-mail.
N3. Collections of web addresses and articles in electronic form, which are an additional source of teaching material, contextually related laboratory tasks. Materials sent by e-mail.
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_W03 PEK_U01	During the laboratory classes, students solve 9 laboratory tasks in accordance with the specification. For each correctly solved problem is worth 0, 1 or 2 points.

	PEK_U02 PEK_U03	
F2	PEK_W01 PEK_W02 PEK_W03 PEK_U01 PEK_U02 PEK_U03 PEK_K01 PEK_K02	The summary of the laboratory is design multimedia e-learning applications (with elements of interactive tests) according to the specifications of 10 laboratory task in AS 3.0 and run on an Android tablet. The task 10 may be obtained 0, 1, 2, 3 or 4 points.

C The final evaluation of the laboratory is determined by the points P obtained during the laboratory according to the table. Assessment 5.0 and 5.5 can be obtained only under the condition that solves the task 10

P	10-11	12-13	14-15	16-17	18-20	21-22
Grade	3,0	3,5	4,0	4,5	5,0	5,5

The final evaluation of the laboratory is determined by the points P obtained during the laboratory according to the table. Assessment 5.0 and 5.5 can be obtained only under the condition that solves the task 10

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Derrick Ypenburg, ActionScript 3.0: Visual QuickStart Guide, Peachpit Press, 2009.
[2] Adobe Creative Team, Adobe Flash Professional CS6 Classroom in a Book, Adobe System Incorporeted, 2012.
[3] Keith Peters, ActionScript 3.0 Animation. Making Things Move !, Friendsof, 2007.
[4] Stephen Chin, Dean Iverson, Oswald Campesato, Paul Trani, Pro Android Flash, Appres, 2011.
[5] Eric T Freeman, Elizabeth Robson, Head First HTML5 Programming: Building Web Apps with JavaScript, O'Reilly, 2011.
[6] Eric Rowell, HTML5 Canvas Canvas Cookbook, Packt Publishing, 2011.

SECONDARY LITERATURE:

[1] Matthew MacDonald, HTML5: The Missing Manual, O'Reilly, 2011.
[2] Chuck Hudson, Tom Leadbetter, HTML5 Developer's Cookbook, Addison-Wesley, 2012.
[3] Shelley Powers, Painting the Web, Shelley Powers, 2008.
[4] Jim Ver Hague, Chris Jackson, Flash 3D: animation, interactivity and games, Elsevier/ Focal Press, 2006.
[5] Adobe Creative Team, Adobe Photoshop Professional CS6 Calssroom in a Book, Adobe System Incorporated, 2012.
[6] Sham Tickoo, Autodesk 3ds Max Design2013: A Tutorial Approach, Autodesk, 2012.
[7] Cameron Chapman, The Smashing Idea Book: From Inspiration to Application (Smashing Magazine Book Series), Wiley and Sons, 2011.
[8] Pete Brown, Silverlight 5 in Action, Manning Publications Co, 2012.
[9] Mike Snell, Lars Powers, Microsoft Visual Studio 2010 Unleashed, Pearson Education Inc, 2011.

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)
Doc. dr inż. Krzysztof Waśko, krzysztof.wasko@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Multimedia Information Systems

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

IT

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 (knowledge)	K1INF_W05, K1INF_W23	C1,C2,C3	Lec1-Lec15	N1, N2, N3, N4
PEK_W02	K1INF_W05, K1INF_W23	C1,C2,C3	Lec1-Lec15	N1, N2, N3, N4
PEK_W03	K1INF_W05, K1INF_W23	C1,C2,C3	Lec1-Lec15	N1, N2, N3, N4
PEK_U01 (skills)	K1INF_U10, K1INF_U11	C1,C2,C3	Lab1-Lab15	N1, N2, N3, N4
PEK_U02	K1INF_U10, K1INF_U11	C1,C2,C3	Lab1-Lab15	N1, N2, N3, N4
PEK_U03	K1INF_U10, K1INF_U11	C1,C2,C3	Lab1-Lab15	N1, N2, N3, N4
PEK_K01 (competences)	K1INF_K01, K1INF_K02	C1,C2,C3	Lec1-Lec15 Lab1-Lab15	N1, N2, N3, N4
PEK_K02	K1INF_K01, K1INF_K02	C1,C2,C3	Lec1-Lec15 Lab1-Lab15	N1, N2, N3, N4

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish Programowanie internetowe w Javie…….

Name in English Java Internet Programming…….

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)	30		30		
Number of hours of total student workload (CNPS)					
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					
Number of ECTS points					
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes					

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Familiarity with Object Oriented programming paradigm.
2. C++ literacy
3. The ability to decompose real life problems.

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SUBJECT OBJECTIVES

C1 Mastering the object oriented programming paradigm.
C2 Presentation of the Java programming language.
C3 Making familiar with basic internet java programming.
C4 Learning to communicate the results of the work.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 Understanding the OO programming paradigm.
PEK_W02 Learning the Java programming language.
PEK_W03 Is familiar with principles GUI programming.
PEK_W04 Is familiar with principles of Internet programming.

relating to skills:
PEK_U01 Mastering the problem analysis and its implementation using the OO programming paradigm.
PEK_U02 Mastering the usage of development tools.
PEK_U03 Practices the recommended principles of problem implementation and program development.

relating to social competences:
PEK_K01 Knows how to concisely and exhaustively communicate the results of her/his word in English.

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Language fundamentals, comparison with CPP.	2
Lec 2	Java programming environment, code development, program structure.	2
Lec 3	Variables and data types, constants, operators and expressions, decision making, branching and looping	2
Lec 4	Object orientation: encapsulation, inheritance, polymorphism, overriding.	2
Lec 5	String formatting and parsing, working with dates and numbers.	2
Lec 6	UI and graphics programming.	2
Lec 7	Collections: Vectors, Sets, Trees, Maps	2
Lec 8	Generic collections	2
Lec 9	Exceptions, error handling, assertions, JUnits.	2
Lec 10	I/O and Streams.	2
Lec 11	Threads control, object lock and synchronization.	2
Lec 12	Introduction to Networking with Java, HTML parsing.	2

Lec 13	Applet programming.	2
Lec 14	Object Streams and RMI, client and server sockets, Object serialization	2
Lec 15	Final Test	2
	Total hours	30

Form of classes - class		Number of hours
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		Number of hours
Lab 1	Introductionary class.	2
Lab 2	Using existing applets.	2
Lab 3	Familiarizing with the Java IDE.	2
Lab 4	First classes.	2
Lab 5	Class Inheritance and aggregation.	2
Lab 6	Polymorphism, overriding.	2
Lab 7	Basic GUI programming.	2
Lab 8	Advanced GUI programming.	2
Lab 9	Collections Array, Vector, Sets.	2
Lab 10	Collections: Trees, Maps.	2
Lab 11	Data reformatting and error handling.	2
Lab 12	Multithread programming.	2
Lab 13	Data extraction from Web pages.	2
Lab 14	Applet development.	2
Lab 15	Practical test.	2
	Total hours	30

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		

	Total hours	
Form of classes - seminar		**Number of hours**
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Lectures with multimedia presentations. N2. Presentation of software presentation tools. N3. E-learning system for publication of primary and supplementary course materials. N4. Laboratory work

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_W03 PEK_W04	Final test checking students' theoretical knowledge and ability to analyze source code. To pass a student has to get at least 50% of all points.
F2	PEK_W02 PEK_W03 PEK_U01 PEK_U02 PEK_U03 PEK_K01	Solving tasks given by the teacher. The student has to explain the way he/she has solved any task and be able to introduce small changes to the solution in an on-line manner. Solving at least 80% of all task is obligatory.
F3	PEK_U01 PEK_U02 PEK_U03	Final test. Developing code of 3 tasks provided by the teacher. Solving 2 of them is necessary to pass.
P1	All effects	The final grade is composed from the following ingredients: 60% F1 25% F2 15% F3 The grades are assigned according to the following principle: <40% 2,0 <=40, 50> 3,0 <=50, 60> 3,5 <=60, 70> 4,0 <=70, 80> 4,5 <=80, 90> 5,0 <=90, 100>= 5,5
C		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Eckel B.: Thinking in Java, available at www.bruceeckel.com
[2] Burd B.: Java For Dummies, Wiley Publishing Inc.
[3] Cadenhead R.:Sams Teach Yourself Java in 21 Days (Covering Java 7 and Android) Prentice Hall Publishing\

SECONDARY LITERATURE:

[1] Schildt H.: Java The Complete Reference, The McGraw Inc.
[2] Flanagan D.: Java Examples in a Nutshell, O'Reilly
[3] Darwin I.F.:Java Cookbook, O'Reilly

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

Ph.D. Andrzej Siemiński

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Java Internet Programming

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science

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 (knowledge)	K1INF_05	C1	Lec1, Lec4	N1, N3
PEK_W02	K1INF_06	C2	Lec2, Lec3, Lec5, Lec7, Lec8, Lec 9, Lec 10, Lec11	N1, N3
PE_W03	K1INF_05	C3	Lec6	N1, N3
PE_W04	K1INF_14	C4	Lec12-Lec14	N1, N3
PEK_U01 (skills)	K1INF_U03	C1	Lab1, Lab9, Lab 10	N2, N4
PEK_U02	K1INF_U15	C2	Lab 3, Lab4,	N2, N4
PEK_U03	K1INF_U04	C2	Lab 5, Lab6, Lab 7, Lab8, Lab11, Lab 13, Lab 14	N2, N4
PEK_K01 (competences)	K1INF_K06	C4	Lab2-Lab13	N2, N4

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY OF INFORMATICS AND MANAGEMENT / DEPARTMENT……

SUBJECT CARD

Name in Polish: Wstęp do grafiki komputerowej
Name in English: Introduction to Computer Graphics
Main field of study (if applicable): Informatics
Specialization (if applicable): ……..
Level and form of studies: 1st level, full-time
Kind of subject: optional
Subject code INZ0271Wl
Group of courses YES

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30		30		
Number of hours of total student workload (CNPS)	60		90		
Form of crediting	crediting with grade	Examination / crediting with grade*	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		3		
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes	1.2		1,8		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knows elementary notions and computational methods of linear algebra and geometry in 2D and 3D
2. Is fluent in Java or C++ programming and knows basic general purpose algorithms and data types
3. Knows one of popular development environments for C++ or Java

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SUBJECT OBJECTIVES

C1 The students should know and understand the methods of 2D image rendering and 2D visualization, deeply understand how they work and what are their features and limitations.

C2 The students should know how to use practically standard software components supporting 2D and 3D CG application development in Java environment

C3 The students should be able to select appropriate methods and software components according to the particular needs related to the CG application domain and build CG application that renders plain image or 3D scene view using these software components

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Knows color spaces used in CG and understands differences between them
PEK_W02 Knows principles of transformation composition in homogenous coordinates
PEK_W03 Understands principles of curves modeling in 2D
PEK_W04 Knows properties of commonly used 3d rendering methods
PEK_W05 Knows and understands stages of typical 3D rendering pipeline
PEK_W06 Knows most popularly used geometry representation techniques for 3D
PEK_W07 Knows and correctly interprets components of Phong lighting model formula

relating to skills:

PEK_U01 Can implement procedural pattern rendering of regular 2D using raster and vector approach
PEK_U02 Is able to design and implement graphical UI using standard software components available in Java
PEK_U03 Can construct the transformation matrix in homogenous coordinates corresponding to visually specified transformation
PEK_U04 Can implement simple CG applications for 3D rendering based on OpenGL usage
PEK_U05 Can select scene description methods according to specified CG application and is able to find out reasons of defects appearing in obtained images
PEK_U06 Is able to evaluate efficiency of low-level methods and algorithms used in 2D and 3D CG

relating to social competences:

PEK_K01 Understands and appreciates the role of graphical interfaces in applications not directly related to computer science
PEK_K02 Is able to compose GUI and visualization methods appropriate to needs of end users not being IT specialists

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction, defining the scope of computer graphics, relation to other computer engineering domains, basic definitions and notions, raster graphics and vector graphics	2
Lec 2	CG program architecture, components for GUI building in Java2D and Swing	2
Lec 3	Color spaces in CG	2
Lec 4	Transformations in homogenous coordinates, general principles and advantages, affine transformation, derivation of transformation matrices for scaling rotation and translation	2
Lec 5	Derivation of transformation matrix for compound transformations in homogenous transformations, transformation superposition, examples	2
Lec 6	Bilinear interpolation of image attributes, application in image transformations, Gouraud shading	2
Lec 7	Curves modeling in 2D, Lagrange and Bezier curves, piecewise defined curves, B-splines	2
Lec 8	Introduction to 3D image synthesis, basic notions, scene	2

	description elements, lighting model, local and global illumination	
Lec 9	3D scene geometry description, boundary representation, CSG, implicit surfaces, metaballs, volumetric representations, lighting models, Phong lighting model	2
Lec 10	Rendering pipeline, geometric transformations in 3D, observer coordinate system, projections from 3D to 2D	2
Lec 11	Visibility analysis methods, algorithms based on face sorting z-buffer algorithm, displaying transparent objects with z-buffer	2
Lec 12	OpenGL library, core functionality, rendering program organization for OpenGL, examples of visual effects available in OpenGL programs	2
Lec 13	Providing geometry to OpenGL, defining geometric transformations, application of transformation matrix stack, defining observer parameters, analysis of exemplary programs	2
Lec 14	Other 3D rendering component packages review: Direct3D and Java3D. Brief review of advanced 3D rendering methods, backward ray tracing, radiosity, photon mapping	2
Lec 15	Final test	2
	Total hours	**30**

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		**Number of hours**
Lab1	Lab scope safety regulations grading policy presentation, installation of IDE, short introduction to CG packages in Java	2
Lab2	Procedural rendering of 2D patterns using BufferedImage class	2
Lab3	Vector graphics components usage in interactive graphics, simple animation using vector graphics components	2
Lab4	GUI implementation using Swing components	2
Lab5	Image composition using affine transformations	4
Lab6	Bilinear and bicubic color interpolation, application to image scaling	2
Lab7	Implementation of Gouraud shading - displaying polygons with Gouraud shading	2
Lab8	Simple rendering of 3D scenes with Phong lighting model	2
Lab9	3D shape modeling by curve rotation and translation - conversion to triangle mesh, implementation of wireframe display of triangle meshes	4
Lab10	Scene rendering program based on OpenGL or java3D	2
Lab11	3D visualization program with observer interactive setting	4
Lab12	Summary, presentation of implemented 3D programs, final grading	2
	Total hours	30

Form of classes - project		Number of hours
Proj1		
Proj2		
Proj3		
Proj4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem1		
Sem2		
Sem3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Multimedia presentation used in lectures N2. Compilers and development environment for Java and C++ N3. Freeware and open source programs for 3D scene modeling N4. E-learning system used to publish presentations, documents and other data related to the lecture and lab assignments

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 - Lab2	PEK_U01	Each assignment Lab2-Lab11 will be evaluated in the scale 2.0 - 5.0. The elements being evaluated: conformance with the assignment specification, ability to make small extensions and modifications to home-prepared code, relevance of used methods, efficiency, ability to predict results of processing of specified input data set , code clarity
F2 - Lab3	PEK_U01 PEK_U02	As in the case of grading of assignment in Lab2
F3 - Lab4	PEK_W02 PEK_U02 PEK_K01 PEK_K02	As in the case of grading of assignment in Lab2

F4 - Lab5	PEK_W01 PEK_W02 PEK_U03	As in the case of grading of assignment in Lab2
F5 - Lab6	PEK_W01 PEK_U02	
F6 - Lab7	PEK_W04 PEK_W05 PEK_U05 PEK_U06	As in the case of grading of assignment in Lab2
F7 - Lab8	PEK_W01 PEK_W04 PEK_W05 PEK_W07 PEK_U05	As in the case of grading of assignment in Lab2
F8 - Lab9	PEK_W03 PEK_W06 PEK_U04 PEK_U05	As in the case of grading of assignment in Lab2
F9 - Lab10	PEK_W04 PEK_W05 PEK_U02 PEK_U04 PEK_U05	As in the case of grading of assignment in Lab2
F10 - Lab11	PEK_W04 PEK_U02 PEK_U04	As in the case of grading of assignment in Lab2

C - the final grade will be calculated as equally weighted average of the grade being the evaluation of the final test carried out at the last lecture (FT) and the grade form the lab which in turn will be computed as equally weighted average of grades obtained from the assignments Lab2-Lab11. The test will be graded based on the total number of scores given for all tests elements according to the scale:

0 - 50% of total scores - 2.0
51 - 60% of total scores - 3.0
61 - 70% of total scores - 3.5
80 - 89% of total scores - 4.0
90 - 95% of total scores - 4.5
96 - 100% of total scores - 5.0

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Foley J.D. et al. Computer Graphics, Principles and Practice, Third Edition, Addition-Wesley, 2013
[2] Klawonn F., Introduction to Computer Graphics: Using Java 2D and 3D, Second edition, Springer 2012
[3] Shreiner D. et al., OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 4.3 (8th Edition)

SECONDARY LITERATURE:

[1] Ammerall L., Zhang K., Computer Graphics for Java Programmers, John Wiley & Sons, 2007
[2] McReynolds T., Blythe D., Advanced Graphics Programming Using OpenGL, Elsevier 2005

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Introduction to Computer Graphics

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Informatics

AND SPECIALIZATION (not defined)

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)	K1INF_W23	C1	Lec1,Lec3	N1,N4
PEK_W02	K1INF_W01, K1INF_W23	C1,C3	Lec4,Lec5	N1,N4
PEK_W03	K1INF_W01, K1INF_W23	C1	Lec7	N1,N4
PEK_W04	K1INF_W23	C1,C3	Lec8,Lec9,Lec10,Lec15	N1,N4
PEK_W05	K1INF_W23	C1	Lec8,Lec9,Lec10,Lec11	N1,N4
PEK_W06	K1INF_W23, K1INF_W08	C1,C3	Lec7,Lec8,Lec9	N1,N4
PEK_W07	K1INF_W23	C1,C3	Lec9,Lec12	N1,N4
PEK_U01 (skills)	K1INF_U04, K1INF_U09, K1INF_U12, K1INF_U16	C2	Lec1,Lec2,La2	N2,N4
PEK_U02	K1INF_U04, K1INF_U12, K1INF_U16	C2,C3	Lec2,La3,La4	N2,N4
PEK_U03	K1INF_W01, K1INF_U11	C1,C3	Lec4,La5	N1,N4
PEK_U04	K1INF_U04, K1INF_U12, K1INF_U16	C2	Lec12,Lec13, La10,La11	N2,N3,N4
PEK_U05	K1INF_U06, K1INF_U11	C3	Lec6,Lec8,Lec9, La7,La8,La9	N1,N3,N4
PEK_U06	K1INF_U07, K1INF_U11	C1,C3	Lec6,La6,La7	N1,N2,N3,N4
PEK_K01 (competences)	K1INF_K02, K1INF_K07	C3	Lec1,Lec2,La3,La4,La5	N1,N4
PEK_K02	K1INF_K02, K1INF_K07	C3	Lec1,Lec2,Lec14,Lec15,La3,La4, La5	N1,N2,N3,N4

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY OF INFORMATICS AND MANAGEMENT / DEPARTMENT OF INFORMATICS

SUBJECT CARD

Name in Polish Projektowanie oprogramowania
Name in English Software System Development
Main field of study (if applicable): Informatics
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)	30			30	
Number of hours of total student workload (CNPS)	60			90	
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			3	
including number of ECTS points for practical (P) classes	0			3	
including number of ECTS points for direct teacher-student contact (BK) classes	1,2			1,8	

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. A student defines features of object-oriented paradigm
2. A student knows and describes basic software life-cycle models
3. A student applies a programming language for solving algorithmic problems; he/she knows how to implement graphical user interface in a selected tool and programming language.

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SUBJECT OBJECTIVES

C1 To familiarize students with the tasks carried out during the basic software life-cycle processes according to ISO/IEC 12207; To teach students good design practices (including design patterns) and to prepare them for team project course (for programmatic projects)
C2 To develop students' skills that will enable them to develop technical project documentation in the UML with the appropriate tools

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 A student lists and describes basic software life-cycle processes

PEK_W02 A student recognizes and describes elements used in basic UML diagrams applied for software modeling and specification

PEK_W03 A student lists, classifies and selects appropriate design patters in the context of existing problem

PEK_W04 A student lists some tools used for software modeling, specification, implementation and testing

relating to skills:

PEK_U01A student uses UML for requirement specification and business modeling

PEK_U02 A student designs a graphical user interface

PEK_U03 A student adapts basic architectural patterns and design patterns to solved engineering problem

PEK_U04 A student implements selected functional requirements in a high level programming language

PEK_U05 A student plans and specifies tests, and carry out functional testing process

relating to social competences:

PEK_K01 A student has awareness of the importance of non-technical aspects of activity of computer engineer, understands the need to provide high quality information systems, taking into account the needs of different user groups.

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction. Basic definitions.	2
Lec 2	Stakeholder requirements definition process. Techniques of requirements elicitation. Domain model and vocabulary.	2
Lec 3	System requirements analysis process. Requirements classification. Requirements diagrams.	2
Lec 4	System architectural design process. Selected architectural perspectives.	2
Lec 5	Requirements analysis process. How to write effective use-cases.	2
Lec 6	User interface prototype. GUI design guideline.	2
Lec 7	Software architecture design process. Architectural patterns.	2
Lec 8	Data base design. Desing of use-case realizations.	2
Lec 9	Architectural mechanisms. Application of state machines to object's life cycle design.	2
Lec 10	Design patterns – examples and discussion.	2
Lec 11	Detail design process.	2
Lec 12	Software construction process.	2
Lec 13	Software testing. Testing techniques.	2
Lec 14	Integration, qualification testing, and installation processes.	2
Lec 15	Repetition.	2

	Total hours	30

Form of classes - project		**Number of hours**
Proj 1	Introduction to the project.	2
Proj 2	Elaboration of application concept (vision, glossary, business rules, domain model)	6
Proj 3	Requirement specification (functional, and non-functional requirements, use-case model, prototype of GUI)	6
Proj 4	Design (architectural design, use-case realization, class details)	6
Proj 5	Construction and testing	8
	Total hours	30

TEACHING TOOLS USED

N1. Informative lecture supported by multimedia presentations
N2. Examples of documents
N3. Case tool, IDE used for programming and testing
N4. E-learning system used for materials publication, gathering and assessing students projects

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 – elaboration of application concept	PEK_U01	Checking of completeness, intra and inter consistency. Up to 15% of maximal number of points for the whole project
F2 – requirements specification	PEK_U02, PEK_K01	Checking of intra-consistency, completeness, correctness, GUI guidelines. Up to 25% of the maximal number of points for the whole project
F3 - design	PEK_U01, PEK_U03	Checking for inter-consistency (with preceding phases, and between different diagrams), completeness. Up to 30% of the maximal number of points for the whole project
F4 – construction and tests	PEK_U04, PEK_U05	As above. Up to 30% of the maximal number of points.
F5 – final grade from project	PEK_U01, …, PEK_U05	The grade calculated basing on the formula: < 40% punktów → ndst. <40%, 50%) → 3.0 <50%, 60%) → 3.5 <60%, 70%) → 4.0 <70%, 80%) → 4.5 <80%, 90%) → 5.0 >90% → 5.5
F6 – final grade from lecture	PEK_W01, PEK_W02, PEK_W03,	Exam – multiple choice test. The grade is calculated basing on the formula: <50%, 60%) → 3.0 <60%, 70%) → 3.5 <70%, 80%) → 4.0

	PEK_W04	<80%, 90%) → 4.5 >90% → 5.0
P – final grade from the course	All	The final grade is calculated as (0.4 * F5 + 0.6 * F6)

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Bruegge Bernd. Object-oriented software engineering: using UML, Patterns, and Java. Pearson/Prentice Hall, cop. 2004.
[2] Pfleeger Shari Lawrence. Software engineering: theory and practice. Pearson/Prentice Hall, 2006.

SECONDARY LITERATURE:

[1] Sommerville Ian, Software engineering, Addison-Wesley, 2007.
[2] Materials prepared by the lecturer

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

System Software Development

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Informatics

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	K1INF_W07	C1	Wy2, …, Wy5, Wy7, Wy8, Wy11, …, Wy15	N1, N4
PEK_W02	K1INF_W07	C2	Wy2, Wy3, Wy4, Wy8, Wy9	N1, N2, N4
PEK_W03	K1INF_W05	C1	Wy7, Wy10	N1, N4
PEK_W04	K1INF_W07	C2	Wy1, Wy6, Wy13	N1, N4
PEK_U01	K1INF_U03, K1INF_U13	C2	Proj2, Proj3, Proj4	N2, N3, N4
PEK_U02	K1INF_U03, K1INF_U14	C1	Proj3	N2, N3, N4
PEK_U03	K1INF_U03, K1INF_U04	C1, C2	Proj4	N3, N4
PEK_U04	K1INF_U02, K1INF_U04	C1	Proj5	N3, N4
PEK_U05	K1INF_U04	C1	Proj5	N3, N4

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

*** - from table above

FACULTY OF COMPUTER SCIENCE AND MANAGEMENT

SUBJECT CARD

Name in Polish: Bezpieczeństwo systemów informatycznych
Name in English: Computer Security
Main field of study (if applicable): Computer Science
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)	30	15	15		
Number of hours of total student workload (CNPS)	60	30	30		
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	1		
including number of ECTS points for practical (P) classes	0	0	1		
including number of ECTS points for direct teacher-student contact (BK) classes	1,2	0,6	0,6		

*delete as applicab le

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Operating systems
2. Computer networks
3. Computer architecture

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SUBJECT OBJECTIVES

C1 Identify and analyze basic security problems of computer systems
C2 Demonstrate knowledge of the use, care, and maintenance of security related tools
C3 Demonstrate the ability to communicate effectively in solving common IT security problems

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 Student has a knowledge about computer security threats
PEK_W02 Student has a knowledge about basic security countermeasures
relating to skills:
PEK_U01 Student can identify the common security problems
PEK_U02 Student can select and use some security countermeasures
relating to social competences:
PEK_K01 Student understands the important societal implications of computer security
PEK_K02 Student can cooperate to get the security related information and to improve security level of the computer system

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction to Computer Security	2
Lec 2	Security Models	2
Lec 3	Information Flow	2
Lec 4	Access Control	2
Lec 5	Symetric-Key Encryption	2
Lec 6	Message Integrity	2
Lec 7	Public Key Kryptography	2
Lec 8	Authentication and Key Exchange Protocols	2
Lec 9	System Security	2
Lec 10	Application Security	2
Lec 11	Web Security	2
Lec 12	Application Security	2
Lec 13	The Trusted Computing Architecture	2
Lec 14	Security Policy	2
Lec 15	Rules and Regulations for Cyber Security	2
	Total hours	30

Form of classes – class		**Number of hours**
Cl 1	Modeling and Analyzing Computer Security	1
Cl 2	Access Control Matrix	2
Cl 3	Take-Grant Model	2
Cl 4	Protection Models	2
Cl 5	Confidentiality/Integrity Policy	2
Cl 6	Bell LaPadula Model, Biba Integrity Model	2
Cl 7	Information Flow, Authentication/Integrity, Cryptography	2
Cl 8	System Design and Validation, Audit, and Malware	2
	Total hours	15

Form of classes - laboratory	**Number of hours**

Lab 1	Basic Security Tools	1
Lab 2	Windows Security	2
Lab 3	Linux Security	2
Lab 4	Information Gathering	2
Lab 5	Operating System-based Vulnerability Assessment	2
Lab 6	Penetration Testing	2
Lab 7	Working with Exploits	2
Lab 8	Social Engineer Toolkit	2
	Total hours	15

Form of classes - project		**Number of hours**
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lecture
N2. Students' own work.
N3. Lab exercises
N4. Classes assignments
N5. Individual consultations with teacher

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- PEK_U03, PEK_K01- PEK_K02,	Lab reports and Classes exercises
P PEK_W01- PEK_W02, Final Exam		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] M.Bishop, Introduction to Computer Security, Addison Wesley Professional; 2005
[2] R.Anderson, Secuiryt Engineering, Wiley, 2008
[3] W.Stallings, Computer Security: Principles and Practice, 2011

SECONDARY LITERATURE:

[1] B.Shneier, Applied Cryptography: Protocols, Algorithms, and Source Code in C,1996
[2] A.Singh, Metasploit PenetrationTesting Cookbook, Pack Publishing, 2012
[3] A.Menezes, Handbook of Applied Cryptography (Discrete Mathematics and Its Applications), 1996

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Computer Security
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
Computer Science
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 (knowledge)	K1INF_W13	C1	Lec2-Lec15	N1,N4
PEK_W02	K1INF_W13	C1	Lec1,Lec15	N1,N4
PEK_U01 (skills)	K1INF_U09	C2	Lec1-Lec15 Lab2,Lab4,Lab5,Lab7,Lab8 Cl1-Cl8	N2-N5
PEK_U02	K1INF_U03, K1INF_U09	C2,C3	Lec1-Lec15 Lab2 ,Lab4,Lab7,Lab8 Cl1-Cl8	N2-N5
PEK_K01 (competences)	K1INF_U09, K1INF_U14	C2,C3	Lec1-Lec15 Lab3,Lab5 Cl3-Cl6	N2-N5
PEK_K02	K1INF_U09	C1,C3	Lec1,Lab1-Lab8 Cl1-Cl3	N2,N4-N5
	K1INF_W13	C1,C2,C3	Lab1-Lab8 Cl4-Cl8	N2, N4-N5

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

FACULTY OF COMPUTER SCIENCE AND MANAGEMENT / DEPARTMENT

SUBJECT CARD

Name in Polish Administrowanie Systemami
Name in English System Administration
Main field of study (if applicable): Computer Science
Specialization (if applicable): ……..
Level and form of studies: 1st level, full-time
Kind of subject: optional
Subject code …….
Group of courses YES

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30		30		
Number of hours of total student workload (CNPS)	80		70		
Form of crediting	Examination		Crediting with grade		
For group of courses mark (X) final course	X				
Number of ECTS points	3		2		
including number of ECTS points for practical (P) classes			2		
including number of ECTS points for direct teacher-student contact (BK) classes	1,8		1,2		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. The student has a basic knowledge of computer systems and completed the course Introduction to Computer Systems.
2. The student has a basic knowledge of operating systems and completed the course Operating Systems.
3. The student has a basic knowledge of computer networks and completed the course Computer Networks and Communications.

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SUBJECT OBJECTIVES

C1. Acquire the basic knowledge and practical skills related to administering of servers.
C2. Acquire the basic knowledge and practical skills related to administering of network services.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 - student has a basic knowledge of the functioning of network operating systems.
PEK_W02 - student has a basic knowledge of the functioning of network services.

relating to skills:
PEK_U01 - student has basic skills in the administration of network operating systems.
PEK_U02 - student has basic skills in the administration of network services.

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours**
Lec 1	Introduction into administering. System installation issues.	2
Lec 2	Administering using GUI nad consoles.	2
Lec 3	User and group account management.	2
Lec 4	File system management.	2
Lec 5	Data compression. Backup. Scheduling of administrative tasks.	2
Lec 6	System update and upgrade. Additional software installation and deinstallation using repositories.	2
Lec 7	Printing in network environment. GUI on Linux like systems.	2
Lec 8	Network configuration and software routing.	2
Lec 9	Firewalls and network traffic management.	2
Lec 10	DHCP and DNS servers.	2
Lec 11	File servers.	2
Lec 12	WWW server.	2
Lec 13	Virtualization.	2
Lec 14	System hardening. Remote administration.	2
Lec 15	Content management systems.	2
	Total hours	30
Form of classes - laboratory		**Number of hours**
Lab 1	Introduction to laboratory.	2
Lab 2	System installation.	2
Lab 3	Text consoles: shells, basic commands, scripts.	2
Lab 4	Practical user and group management.	2
Lab 5	Practical filesystem management.	2
Lab 6	Data compression. Backup. Scheduling of administrative tasks.	2
Lab 7	System update and upgrade. Additional software installation and deinstallation using repositories.	2
Lab 8	Printing configuration. Test – Management of server operating system and user environment.	2
Lab 9	Network connection and software routing configuration.	2
Lab 10	Firewall configuration.	2
Lab 11	DHCP and DNS servers configuration	2
Lab 12	File server configuration.	2
Lab 13	WWW server configuration.	2
Lab 14	Virtualization. Remote administering.	2
Lab 15	Test – Network infrastructure and network services management.	2
	Total hours	30

TEACHING TOOLS USED
N1. Lecture N2. Laboratories with access to server operating systems with administrative privileges. N3. Contact hours. N4. Student work – Preparation to laboratories.

N5. Student work – Preparation to Exam.

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_U01	Test – Management of server operating system and user environment. (Lab. 8)
F2	PEK_U02	Test – Network infrastructure and network services management. (Lab. 15)
P	PEK_W01, PEK_W02	Examination

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Evii Nemeth, Trent R., Hein, Garth Snyder, Ben Whaley: Unix and Linux System Administration Handbook, Published 2011 by Pearson Education.
[2] Christopher Negus, Christine Bresnahan: Linux Bible, Published 2012 by Wiley.
[3] William R. Stanek: Windows Server 2012 Pocket Consultant, Published in 2012 by Microsoft Press.

SECONDARY LITERATURE:

[1] Cricket Liu, Paul Albitz: DNS and BIND, Published June 2nd 2006 by O'Reilly Media.
[2] William E. Shotts Jr: The Linux Command Line: A Complete Introduction, Published 2012 by No Starch Press.

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

System Administration

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science

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 (knowledge)	K1INF_W10	C1	Lec 1-7	N1,3,5
PEK_W02	K1INF_W11	C2	Lec 7-15	N1,3,5
PEK_U01 (skills)	K1INF_U14	C1	Lab 1-8	N2,3,4
PEK_U02	K1INF_U08, K1INF_U09	C2	Lab 9-15	N2,3,4

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

*** - from table above

FACULTY OF COMPUTER SCIENCE AND MANAGEMENT

SUBJECT CARD

Name in Polish Bezpieczeństwo Systemów Teleinformatycznych
Name in English Security in Computer Network
Main field of study (if applicable): Computer Science
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)	30		30		
Number of hours of total student workload (CNPS)	60		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		3		
including number of ECTS points for practical (P) classes			3		
including number of ECTS points for direct teacher-student contact (BK) classes	1,2		1,8		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Operating systems
2. Computer networks
3. Computer architecture

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SUBJECT OBJECTIVES

C1 Identify and analyze basic security problems of computer networks
C2 Demonstrate knowledge of the use, care, and maintenance of computer network security related tools
C3 Demonstrate the ability to communicate effectively in solving common IT security problems

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Student has a knowledge about computer network security threats

PEK_W02 Student has a knowledge about general requirements related to network protection

relating to skills:

PEK_U01 Student can identify the common network security problems

PEK_U02 Student can select and use some network security tools

relating to social competences:

PEK_K01 Student understands the important societal implications of computer network security

PEK_K02 Student can cooperate to get the security related information and to improve network security level of the computer system

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction to Network Security	2
Lec 2	Building Security into the Network	2
Lec 3	Network Traffic Monitoring and Filtering	2
Lec 4	Network Protocols and Vulnerabilities	2
Lec 5	IP Security	2
Lec 6	Transport-Level Security	2
Lec 7	Authentication Applications	2
Lec 8	Electronic Mail Security	2
Lec 9	Malware and Network Attacks	2
Lec 10	Intruders and Intrusion Detection	2
Lec 11	Honeypots and Honeynets	2
Lec 12	Anomaly Detection	2
Lec 13	Mobile Systems Security	2
Lec 14	Privacy and Anonymity in Computer Networks	2
Lec 15	Final Exam	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes – laboratory		**Number of hours**
Lab 1	Setting Up Virtual Test Lab Environments	2
Lab 2	Packet Sniffing	2
Lab 3	Password Cracking	2

Lab 4	Firewalls	2
Lab 5	E-mail and Electronic Documents Exchange Security	2
Lab 6	Penetration Testing Tools	2
Lab 7	Advanced Reconnaissance Techniques	2
Lab 8	Web Application Exploitation	2
Lab 9	Exploits and Client-Side Attacks	2
Lab 10	Post-Exploitation	2
Lab 11	Bypassing Firewalls	2
Lab 12	Communication Security	2
Lab 13	Intrusion Detection Systems	2
Lab 14	Honeypots and Honeynets	2
Lab 15	Anonymity in Network Communication	2
	Total hours	30

Form of classes - project		**Number of hours**
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Lecture N2. Students' own work. N3. Lab exercises N4. Individual consultations with teacher

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- PEK_U03, PEK_K01- PEK_K02,	Lab reports.
P PEK_W01- PEK_W02, Final Exam		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Ch.McNab, Network Security Assessment: Know Your Network, 2007
[2] W.Stallings, Network Security Essentials, 2010
[3] L.Allen Advanced Penetration Testing for Highly-Secured Environments: The Ultimate Security Guide, 2012

SECONDARY LITERATURE:

[1] W.Stallings, Cryptography and Network Security: Principles and Practice,2010
[2] N.Dhanjani, Network Security Tools: Writing, Hacking, and Modifying Security Tools,2005
[3] M.Zalewski, Silence on the Wire: A Field Guide to Passive Reconnaissance and Indirect Attacks,2012

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

Grzegorz Kołaczek, Grzegorz.Kolaczek@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Security in Computer Network
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
Computer Science
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 (knowledge)	K1INF_W13	C1	Lec2-Lec13	N1,N4
PEK_W02	K1INF_W13	C1	Lec1,LEC14	N1,N4
PEK_U01 (skills)	K1INF_U09	C2	Lec1-Lec14 Lab2-Lab15	N2-N4
PEK_U02	K1INF_U03, K1INF_U09	C2,C3	Lec1-Lec14 Lab2,Lab2,Lab4,Lab7,Lab8	N2-N4
PEK_K01 (competences)	K1INF_U09, K1INF_U14	C2,C3	Lec1-Lec14 Lab3,Lab5,Lab7,Lab11,Lab15	N2-N4
PEK_K02	K1INF_U09	C1,C3	Lec1,Lab1-Lab15	N2,N4
	K1INF_W13	C1,C2,C3	Lec14,Lab1-Lab15	N2,N4

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

FACULTY OF COMPUTER CIENCE AND MANAGEMENT / DEPARTMENT…

SUBJECT CARD

Name in Polish Prawo autorskie i prawa pokrewne w informatyce

Name in English Copyright and Related Computer Law

Main field of study (if applicable): Computer Science

Specialization (if applicable): ……..

Level and form of studies: 1st/ ~~2nd* level, full-time / part-time*~~

Kind of subject: ~~obligatory~~ / optional ~~/ university-wide*~~

Subject code INZ000288

Group of courses YES / ~~NO~~*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15				15
Number of hours of total student workload (CNPS)	30				30
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				
including number of ECTS points for practical (P) classes	1				
including number of ECTS points for direct teacher-student contact (BK) classes	1,2				

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. None

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SUBJECT OBJECTIVES

C1 Educating the abilities of solving and understanding problems associated with the copyright and related law.

C2 Acquiring the ability of registering patents and understanding differences in the substantive rights and immaterial rights associated with the protection of ownership.

C3 Providing knowledge of protecting moral and economic author's rights.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Student has a basic knowledge in the protection of intellectual property and patent rights He has a knowledge in the copyright and applying it with reference to works about computer character

PEK_W02 Student is holding competences of the industrial property patent specifications and preparing documentation associated with the registration of the invention

PEK_W03 Student has knowledge in the field of protection of author's moral and economic rights.

PEK_W04 Student has a basic knowledge in the scope of humanities essential to understand social and philosophical conditioning of engineering activity.

relating to skills:

PEK_U01 Student is able to protect the author's moral and economic rights connected to computer science works.

PEK_U02 Student knows rules of the trading and devolution of author's rights. He has practical skills to evaluate and protect rights.

PEK_U03 Student is holding competences of solving copyright problems connected to computer science discipline. He has competence to applying knowledge of copyright related rights in computer science profession.

relating to social competences:

PEK_K01 Student has competence to solve social and engineering problems related to computer science.

PEK_K02 Student is able to cooperate and to work in the group, taking different roles on in it

PEK_K03 Student is able to preparing presentation, discussion and argues ethical and law needs in modern computer and information systems

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	The subject matter of law and copyright law. Owner and content.	2
Lec 2	Author and his work. Moral and economic rights. Protected works and permissible use.	2
Lec 3	Authors economic rights terms and scope. Devolution of author rights. Trade of copyrights.	2
Lec 4	Computer software. Computer software engineering and trade. Law regulations and practice.	2
Lec 5	Related rights. Regulations and examples. Patent law.	2
Lec 6	Protection of authors moral and economic rights. Special regulations for images, confidentiality of sources of information and personal data.	2
Lec 7	Organizations for the collective management of authors rights. Criminal liability.	2
Lec 8	Final test.	1
	Total hours	15

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		

..		
	Total hours	

Form of classes - laboratory		Number of hours
Lab 1		
Lab 2		
Lab 3		
Lab 4		
Lab 5		
…		
	Total hours	

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1	Patenting inventions.	2
Sem 2	National and international patent.	2
Sem 3	Trademarks. Software marks.	2
Sem 4	Protection of authors moral and economic rights in practice.	2
Sem 5	Authors economic rights terms and scope. Practical examples.	2
Sem 6	Software copyrights. Practical examples.	2
Sem 7	Devoluted author rights. Applications and examples.	2
Sem 8	Final test	1
	Total hours	15

TEACHING TOOLS USED
N1. Multimedia presentations N2. The course Web page N3. Electronics and paper books, library references

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_U01÷PEK_U03 PEK_K01÷PEK_K03	an oral answers, written short tests

F2	PEK_W01÷PEK_W04 PEK_U01÷PEK_U03 PEK_K01÷PEK_K03	final test
C=	F1+F2	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Polish Copyright Law. Act of 4th February of 1994, No 24, Item 83.
[2] Cohen J. E.: Copyright in a global information economy. Aspen Publishers 2010.
[3] Okediji C. L. & Orourke: Copyright Law. Aspen Publishers 2010.
[4] Thies Ch.: Computer Law and Ethics. Mercury Learning & Information 2013.

SECONDARY LITERATURE:

[1] McJohn S. M.: Examples & Explanantions: Copyright. Aspen Publishers 2012.

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

Arkadiusz Liber, PhD
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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……

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 (knowledge)	K1INF_W19, K1INF_W20	C1, C2	Lect1 – Lect7	N1, N2, N3
PEK_W02	K1INF_W19, K1INF_W20	C1, C2, C3	Lect1 – Lect7	N1, N2, N3
PEK_W03	K1INF_W19, K1INF_W20	C2, C3	Lect1 – Lect7	N1, N2, N3
PEK_W04	K1INF_W19, K1INF_W20	C3	Lect1 – Lect7	N1, N2, N3
PEK_U01 (skills)	K1INF_W19, K1INF_W20	C1, C2, C3	Lect1 – Lect7, Sem1-Sem6	N1, N2, N3
PEK_U02	K1INF_W19, K1INF_W20	C1, C2, C3	Lect1 – Lect7, Sem1-Sem6	N1, N2, N3
PEK_U03	K1INF_W19, K1INF_W20	C1, C2, C3	Lect1 – Lect7, Sem1-Sem6	N1, N2, N3
PEK_K01 (competences)	K1INF_K03	C1, C2, C3	Lect1 – Lect7, Sem1-Sem6	N1, N2, N3
PEK_K02	K1INF_K03, K1INF_K05	C1, C2, C3	Lect1 – Lect7, Sem1-Sem6	N1, N2, N3
PEK_K02	K1INF_K03	C1, C2, C3	Lect1 – Lect7, Sem1-Sem6	N1, N2, N3

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish …*Wytwarzanie interfejsu użytkownika*
Name in English *User Interface Development*
Main field of study (if applicable): Computer Science
Specialization (if applicable): ……..
Level and form of studies: 1st level, full-time
Kind of subject: optional
Subject code …….
Group of courses YES

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30		30		
Number of hours of total student workload (CNPS)	60		90		
Form of crediting	Examination / crediting with grade	Examination / crediting with grade*	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		3		
including number of ECTS points for practical (P) classes			3		
including number of ECTS points for direct teacher-student contact (BK) classes	1,2		1,8		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge in designing of software systems
2. Ability to read with under standing scientific and technical Texas in English.

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SUBJECT OBJECTIVES

C1 To familiarise students with the basis of Cognitive Psychology that are necessary for good understanding of Human Computer Interaction.
C2 To make students aware of the importance of the notion of the software system usability and importance of usability for the overall quality of the software system.
C3 To familiarise students with the overall process of software systems development in way focused on achieving high quality in the domain of usability.
C4. To present methods and techniques for complex usability evaluation.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Students know basic notions and techniques from the domain of applications of Cognitive Psychology in Human Computer Interaction.

PEK_W02 Students know basic set of good practices in the area of user interface designing.

PEK_W03 Students know basic models of the processes of interactive system design and interactive system usability assessment.

…

relating to skills:

PEK_U01 Students are able to perform context of use analysis for an interactive system.

PEK_U02 Students have ability to plan and monitor a process of user interface development.

PEK_U03 Students are equipped to design user interface.

PEK_U04 Students know how to plan a process of usability assessment, to perform it and to draw conclusions related to the necessary changes in the system which has been evaluated.

…

relating to social competences:

PEK_K01 Students are able to cooperate in a team which is developing a software system, in situation in which the team members responsible for the system usability are appointed.

PEK_K02 Students are aware of the influence made by the software system on the work and life environment of the users and understand the importance of the software system usability situated in this context.

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Basic notions and techniques of Cognitive Psychology in the area of Human Computer Interaction.	4
Lec 2	Usability and the process for achieving the high quality of the usability.	2
Lec 3	Context of Use description and analysis.	4
Lec 4	System design process focus on users and their tasks	2
Lec 5	Standards from the area of Human Computer Interaction and their applications in user interface development.	2
Lec 6	Usability evaluation of the user interface.	4
Lec 7	Designing of the structure and the content of web sites, web services and portals.	2
Lec 8	Survey of the most important rules of graphical screen design and applications of the user interaction tools in GUI.	4
Lec 9	Selected case studies in the area of GUI design.	4
Lec 10	Usability specification and usability issues in the project management.	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		

..		
	Total hours	

Form of classes - laboratory		Number of hours
Lab 1	Task-experiment (*performed during laboratory meeting*): an intuitive analysis of a selected application on the basis of exploratory learning (learning by using).	2
Lab 2	Task-experiment (*performed mainly as the own work of students, the results are presented during laboratory meeting*): teaching a person, who has no previous experience in using computers, using some application selected together with the person being taught.	2
Lab 3	Preparation of the general specification of the project (mission, initial, general description of users and their tasks), which will be a main line of the next tasks.	2
Lab 4	Preparation of the description of the context of use (on the basis of the previously collected data).	4
Lab 5	Carrying out the task analysis (on the basis of the description of the context of use).	4
Lab 6	Construction of the conceptual design of the user interface.	2
Lab 7	Initial specification of the user interface technical design and construction of the initial paper prototype.	4
Lab 8	Construction of the initial electronic prototype (*performed mainly as the own work of students, the results are presented during laboratory meeting*).	4
Lab 9	Preparation of the analytical usability evaluation by Cognitive Walkthrough and GOMS.	2
Lab 10	Construction of an improved prototype and completion of the usability evaluation for the most important user tasks.	4
	Total hours	30

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1		
…		
	Total hours	

TEACHING TOOLS USED
N1. Textbooks N2. Electronic materials on the selected Web pages and Web sites. N3.Teaching materials published on the E-learning portal of the Faculty of Computer Science and Management.

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 Evaluation of the phases: context of use analysis and task analysis	PEK_W03, PEK_U01, PEK_U02, PEK_K01, PEK_K02	Students present reports that are evaluated.
F2 Evaluation of the user interface design	PEK_W02, PEK_U02, PEK_U03, PEK_K01	Students present user interface design which is evaluated
F3 Evaluation of the prototype and usability evaluation.	PEK_W01, PEK_U02, PEK_U04, PEK_K01, PEK_K02	Students present user interface prototypes, reports including results of the usability evaluation and improved prototypes that are evaluated.
C test for grading – the effects: PEK_W01- PEK_W03		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Barfield L. The User Interface Concepts & Design. Addison-Wesley 1993.
[2] Hackos J., Redish J. User and Task Analysis for Interface Design, Wiley Comp. Pub. 1998.
[3] Newman W., Lamming M. Interactive System Design. Addison-Wesley 1995.
[4] International Standard ISO 9241 (1,2,10-17) Ergonomic requirements for office work with visual display terminals (VDTs), szczególnie: Part 11 Guidance on Usability.
[5] Galitz W.O. Essential Guide to User Interface Design. Wiley Comp. Pub. 2007.
[6] Nielsen J. Projektowanie funkcjonalnych serwisów internetowych. Helion, 2003.
[7] Human-Computer Interaction: Design Issues, Solutions, and Applications. Ed. Andrew Sears i Julie A. Jacko. CRC Press/Taylor & Francis Group, 2009

SECONDARY LITERATURE:

[1] Spool J. M., Scanlon T., Schroeder W., Snyder C., DeAngelon T. Web Site Usability. Morgan Kaufman, 1999.
[2] Marti A. Hearst. Search User Interfaces.

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

User Interface Development…

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

……Computer Science (1st level)

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 (knowledge)	K1INF_W20	C1	Lec1, Lec3	N1-N3
PEK_W02	K1INF_W05	C2, C3	Lec3, Lec7, Lec8, Lec9	N1-N3
PEK_W03	K1INF_W07	C3, C4	Lec2, Lec4, Lec5, Lec6, Lec10	N1-N3
PEK_U01 (skills)	K1INF_U10	C1, C2, C3	Lab1, Lab2	N1-N3
PEK_U02	K1INF_U10	C3	Lab3-Lab5	N1-N3
PEK_U03	K1INF_U10	C3	Lab6-Lab8	N1-N3
PEK_U04	K1INF_U10	C2, C4	Lab9, Lab10	N1-N3
PEK_K01 (competences)	K1INF_K03	C3	Lab3-Lab10	N1-N3
PEK_K02	K1INF_K02	C2	Lab1, Lab2, Lab4, Lab10	N1-N3

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY OF INFORMATICS AND MANAGEMENT / DEPARTMENT……

SUBJECT CARD

Name in Polish: Techniki translacji programów
Name in English: Program Translation Techniques
Main field of study (if applicable): Informatics
Specialization (if applicable): ……..
Level and form of studies: 1st level, full-time
Kind of subject: optional
Subject code: INZ0291Wcl
Group of courses YES

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	15	15		
Number of hours of total student workload (CNPS)	60	40	50		
Form of crediting	crediting with grade	crediting with grade	crediting with grade	Examination / crediting with grade*	Examination / crediting with grade*
For group of courses mark (X) final course	X				
Number of ECTS points	2.6	1.2	1.2		
including number of ECTS points for practical (P) classes	0.0	1.2	1.2		
including number of ECTS points for direct teacher-student contact (BK) classes	1.0	1.0	1.0		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic skills in programming in C++ or Java
2. Intermediate knowledge in computer architecture and organization
3. Basic knowledge in algorithms and data structures

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SUBJECT OBJECTIVES

C1 The student should be able to define the syntax of programming languages that can be efficiently analyzed and translated into executable code
C2 After completion of the course the students should be able to develop syntax and semantic analyzers of typical programming languages as well as to create compiler modules responsible for target code generation
C3 Students should be able to efficiently used existing compilers and select high level appropriate programming languages for efficiency-critical applications

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Knows formal methods for syntax and semantic definition of programming languages

PEK_W02 Knows formal foundations of context-free grammars application in syntax analysis

PEK_W03 Understands principles of attribute grammars and its application to contextual language properties

relating to skills:

PEK_U01 Is able to design the syntax of a programming language using context free grammars

PEK_U02 Is able to create the syntax and semantic analyzer using compiler creation tools

PEK_U03 Is able to create a code generator for the simplified target virtual machine

PEK_U04 Is able to predict the structure and efficiency of the machine code created by a typical compiler

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction, elements of programming language definition: syntax, semantics and pragmatics; architecture of a programming language compiler, examples of syntax analysis applications.	2
Lec 2	Formal approach to syntax definition; Chomsky grammars, the notion of derivation, derivation trees. Notation for syntax definition: BNF, EBNF, syntax diagrams	2
Lec 3	Lexical analysis; lexical class definition by regular grammars, extraction of the lexical level from the syntax definition	2
Lec 4	lexical analysis: conversion from regular grammars to finite nondeterministic automata; efficient implementation of lexical analyzer based of deterministic finite automaton	2
Lec 5	Methods of descending syntax analysis, LL(1) grammars, recursive descent approach, building syntax analyzers from syntax diagrams	2
Lec 6	Methods of descending syntax analysis: predictive LL(1) analyzers.	2
Lec 7	Bottom-up syntax analysis methods, LARL analyzers	2
Lec 8	Building control tables fro LALR analyzers using SLR method	2
Lec 9	Using off the shelf components in implementation of syntax analyzers	2
Lec 10	Symbol table organization, symbol table contents, efficient search in symbol tables	2
Lec 11	Contextual language property analysis; attribute grammars, examples of application; efficient implementation of analyzers based on attribute grammars	2
Lec 12	Introduction to code generation, abstract machine architectures for intermediate code generation, defining translation rules with attribute grammars	2
Lec 13	Translation of typical syntax elements: control flow structures,	2

	infix expressions, structural data types, Memory organization in run-time. Subroutine calls translation, Call stack organization, activation record contents	
Lec 14	Code optimization	2
Lec 15	Final test	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1	defining syntax of simple languages	2
Cl 2	lexical analysis	2
Cl 3	top-down syntax analysis	2
Cl 4	bottom-up analysis	2
Cl 5	application of attribute grammars to contextual language properties definition	2
Cl 6	building translation schemes for selected syntax constructs in programming languages	2
Cl 7	Translation of expressions	1
Cl 8	Practical skills test	2
	Total hours	15

Form of classes - laboratory		**Number of hours**
Lab1	Lexical analyzer implementation	2
Lab2	Syntax analyzer implementation	2
Lab3	Checking contextual properties using semantic rules	2
Lab4	Error handling module implementation	2
Lab5	Code generator implementation for compound expressions	2
Lab6	Code generation for control statements and subroutine calls	2
Lab7	Tests and documentation preparation	2
Lab8	Final evaluation and grading	1
	Total hours	15

Form of classes - project		**Number of hours**
Proj1		
Proj2		
Proj3		
Proj4		
…		
	Total hours	

Form of classes - seminar		**Number of hours**
Sem1		

Sem2		
Sem3		
…		
	Total hours	

TEACHING TOOLS USED

N1. standard lecture presentation supported by slideshow presentation
N2. open source and free software components supporting compiler construction (lex, yacc, Bison, ANTLR
N3. development environments for C++ and Java (Eclipse, Netbeans, MSVC)

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		Lecture - written test verifying the formal knowledge related to formal programming languages definition methods and their application to building practical algorithms
F2		Laboratory - the evaluation of the final product (simple compiler) created in results of series of lab assignments. The following elements will be evaluated: correctness of the formal definition of the language, ease of practical use, correctness of automatically created target code, code clarity, appropriate application of common software development practices, completeness of final documentation
F3		Classes - the partial classes grade will be given basing on the result of written test carried out at the last class modified with student's activity (presentation of home-solved exercises) (one successful presentation: +0.5 of grade, failure to present declared exercise: -0.5 of grade)
C - The final grade for the whole group of courses will be the equally weighted average of grades F1, F2, F3 obtained from lecture, classes and laboratory. In order to pass all three grades must be positive.		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Aho A.V. et al, Compilers, principles and tools, Addison-Wesley, 2007
[2] Andrew W. Appel and Jens Palsberg. Modern compiler implementation in Java, Cambridge University Press, 2002
[3] Hopcroft J., Ullman J.D. Motwani R., Introduction to Automata Theory, Languages, and Computation, 3rd Edition, Addison-Wesley, 2006

SECONDARY LITERATURE:

[1] Wilhelm R., Seidl H., Compiler Design. Virtual Machines, Springer, 2010
[2] Kaspersky K., Code Optimization. Effective Memory Usage, A-LIST LCC, 2003
[3] Kaspersky K., Hacker Disassembling Uncovered, A-LIST LCC, 2003

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

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

Program Translation Techniques

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Informatics

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 (knowledge)	K1INF_W06	C1	Lec1, Lec2, Lec11, Cl1, Cl2	N1
PEK_W02	K1INF_W06	C1	Lec3-Lec8, Cl3, Cl4	N1
PEK_W03	K1INF_W06	C1	Lec11, Cl5	N1
PEK_U01 (skills)	K1INF_U01, K1INF_W06	C2	Lec1, Lec2, Lec6-Lec8, Cl1, Lab1, Lab2	N1, N2
PEK_U02	K1INF_U01	C2	Lec6-Lec9, Cl2, Cl3, Cl4, Lab3, Lab4	N1, N2, N3
PEK_U03	K1INF_U01	C2, C3	Lec12-Lec14, Cl6, Cl7, Lab5, Lab6	N1, N2, N3
PEK_U04	K1INF_U01, K1INF_W06	C2. C3	Lec10, Lec14, Cl6, Cl7, Cl8, Lab7, Lab8	N1, N2, N3

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

*** - from table above

FACULTYOF COMPUTER SCIENCE AND MANAGEMENT / DEPARTMENT…

SUBJECT CARD

Name in Polish Społeczne i prawne aspekty informatyki

Name in English Social and Law Aspects of Computer Science

Main field of study (if applicable): Computer Science

Specialization (if applicable): ……..

Level and form of studies: 1st/ ~~2nd* level, full-time / part-time*~~

Kind of subject: ~~obligatory~~ / optional ~~/ university-wide*~~

Subject code INZ000287

Group of courses ~~YES~~ / NO*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30				
Number of hours of total student workload (CNPS)	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					
Number of ECTS points	2				
including number of ECTS points for practical (P) classes	2				
including number of ECTS points for direct teacher-student contact (BK) classes	1,2				

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. None

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SUBJECT OBJECTIVES

C1 Educating the abilities of solving and understanding problems associated with the profession of the computer specialist

C2 Acquiring competence in the scope of the assessment of the copyright connected with the about computer science profession. Educating the ability of the evaluation of the copyright of technical structures associated with components and the building blocks associated with the process of coming into existence and works about computer character or associated with the computer science.

C3 Acquiring the knowledge of both the ability in collecting and analysis of documents about standard character and practical competence in the extent of protection of the industrial property.

C4 Providing practical abilities in methods of the assessment of the effects of the breach of the law and violating ethics in the profession of the computer specialist.

C5 Acquiring the knowledge in the scope of computer ethics.

C6 Acquiring competence and shaping the attitude in the social scope including the ability of the harmonious group work and the reliable, honest and ethical practising a profession of the computer specialist.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Student has an acquaintance of the problems associated with the practising a profession of the computer specialist, is conscious of problems associated with the copyright and the protection law of the industrial property.

PEK_W02 Student has competence in analysis of patent specifications and preparing documentation associated with the registration of the invention.

PEK_W03 Student has an acquaintance knowledge in the copyright and applying it with reference to works about computer character.

PEK_W04 Student has a knowledge in the scope of the assessment of the connected occupational hazard from completion of undertakings about computer character.

PEK_W05 Student knows principles of protection of works about computer character individual and team.

PEK_W06 Student has an acquaintance of processes of the transfer operation of the property of works about computer character.

PEK_W07 Student is possessing the acquaintance of codes of ethics and a skill of applying them in practice.

relating to skills:

PEK_U01 Student is possessing skills of the evaluation of a situation and risks in the working life of the computer specialist.

PEK_U02 Student is possessing skills of noticing and appreciating the social context of the computer science.

PEK_U03 Student is possessing a skill of analysis of patent documentation and the registration of the invention and the work about computer character.

PEK_U04 Student is able to assess issues of law associated with the source materials associated with the completion of a project about computer character and associated with the computer science.

PEK_U05 Student is able to apply principles arising from the copyright in practice.

relating to social competences:

PEK_K01 Student has competence in the practising a profession ethical, in accordance with the law in force of the computer specialist.

PEK_K02 Student is able to notice public aspects of the completion of computer undertakings.

PEK_K03 He is possessing a skill of the independent and creative thinking with the respect for the law and of professional ethics.

PROGRAMME CONTENT

Form of classes - lecture		**Number of**
Lec 1	The specificity of the environment of the professional computer scientist. The ethics and the social meaning of the computer scientist occupation. Ethical codes and codes of practice.	2
Lec 2	The formation, the projection, the production and the exploitation of the software and hardware products in the social context. The interaction and the correlation of ethics and laws.	2
Lec 3	The intellectual property, definitions, legal settlements, examples.	2
Lec 4	The object and the person of author's law. Computer programmes and databases.	2
Lec 5	The authorship of the composition, dependent rights. Personal rights and property -	2

	in the context of compositions about the computer science character.	
Lec 6	The spread of compositions. The protection of compositions about the computer science character and related compositions. The protection of the privacy.	2
Lec 7	The delivery and the sale of copyrights to compositions about the computer science character. The exercise of compositions in frames of the relation of the work inframes of the activity didactic and scientific. Licensing. Passing of copyrights as result of the succession.	2
Lec 8	The criminal responsibility for the violation of copyrights. The computer crimes. Computer forensic.	2
Lec 9	The industrial right properties.	2
Lec 10	Useful examples. Trademarks. Patents. Notifying and the protection.	2
Lec 11	The industrial rights protection in Poland and regulations of the European Union. The intellectual property in the context of the inquiry society.	2
Lec 12	Examples of the use of the copyrights.	2
Lec 13	The copyright and teamworks. The reliability of the software and hardware products. The responsibility for defects.	2
Lec 14	The risk in-service of the computer scientist. The valuation of the risk. The minimization of the risk.	2
Lec 15	Final test.	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		**Number of hours**
Lab 1		
Lab 2		
Lab 3		
Lab 4		
Lab 5		
…		
	Total hours	

Form of classes - project		**Number of hours**
Proj 1		
Proj 2		
Proj 3		
Proj 4		

…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Lecture with using the multimedia slide projector. N2. Consultation. N3. Own work of the student. N4. Electronic using educational platforms.

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_U01÷PEK_U05 PEK_K01÷PEK_K03	an oral answers, written short tests
F2	PEK_W01÷PEK_W06 PEK_U01÷PEK_U05 PEK_K01÷PEK_K03	final test
C=F1+F2		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Cohen J. E.: Copyright in a global information economy. Aspen Publishers 2010.
[2] Okediji C. L. & Orourke: Copyright Law. Aspen Publishers 2010.
[3] Thies Ch.: Computer Law and Ethics. Mercury Learning & Information 2013.

SECONDARY LITERATURE:

[1] McJohn S. M.: Examples & Explanantions: Copyright. Aspen Publishers 2012.

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

Arkadiusz Liber, PhD
Arkadiusz . Liber / at / pwr . wroc . pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……

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, PEK_W02	K1INF_W19, K1INF_K03	C1, C2,C6	Lec1,Lec2,Lec3,Lec4	N1,N2,N3,N4
PEK_W03, PEK_W04	K1INF_K03, K1INF_K05	C1,C2	Lec5,Lec6,Lec7, Lec8,Lec9	N1,N2
PEK_W05, PEK_W06, PEK_W07	K1INF_W19, K1INF_K03, K1INF_K05	C1,C3,C4, C5	Lec10,Lec11,Lec12,Lec13,Lec14,Lec15	N1,N2,N3,N4
PEK_U01, PEK_U02	K1INF_K01, K1INF_K01	C1,C6	Lec1,Lec2,Lec3, ,Lec5,Lec6,Lec7, Lec8,Lec9,Lec10,Lec11,Lec12,Lec13,Lec14	N1,N2,N3
PEK_U03, PEK_U04	K1INF_K03	C1,C3,C4, C5	Lec1,Lec4, ,Lec5,Lec6,Lec7, Lec8,Lec9,Lec10,Lec11,Lec12,Lec13,Lec14	N1,N2,N3,N4
PEK_U05	K1INF_W19, K1INF_K03, K1INF_K05	C1,C3,C4, C5	Lec1,Lec2,Lec3,Lec4,Lec7, Lec8,Lec9Lec10,Lec11,Lec12,Lec13,Lec14	N1,N2,N3,N4
PEK_K01	K1INF_W19, K1INF_K03, K1INF_K05		Lec1,Lec4,Lec7, Lec8,Lec9Lec10,Lec11,Lec12,Lec13,Lec14	N1,N2,N3,N4
PEK_K02, PEK_K02	K1INF_K03	C1,C2,C6	Lec1,Lec4,Lec7, Lec8,Lec9Lec10,Lec11,Lec12,Lec13,Lec14	N1,N2,N3,N4
PEK_W01, PEK_W02	K1INF_W19, K1INF_K03	C1, C2,C6	Lec1,Lec2,Lec3,Lec4	N1,N2,N3,N4
PEK_W03, PEK_W04	K1INF_K03, K1INF_K05	C1,C2	Lec5,Lec6,Lec7, Lec8,Lec9	N1,N2
PEK_W05,	K1INF_W19,	C1,C3,C4,	Lec10,Lec11,Lec12,Lec13,Lec14	N1,N2,N3,N4

PEK_W06, PEK_W07	K1INF_K03, K1INF_K05	C5		
PEK_U01, PEK_U02	K1INF_K01, K1INF_K01	C1,C6,C7	Wy1,Wy2,Wy3, ,Wy5,Wy6,Wy7, Wy8,Wy9,Wy10,Wy11,Wy12,Wy13,Wy14,Wy15	N1,N2,N3

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

*** - from table above

FACULTY: Computer Science & Management…… / DEPARTMENT……

SUBJECT CARD

Name in Polish …Metody Numeryczne…….
Name in English …Numerical Methods…….
Main field of study (if applicable): Computer Science…….
Specialization (if applicable): ……..
Level and form of studies: 1st level, full-time
Kind of subject: optional
Subject code …INZ0292WC…….
Group of courses :YES

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	30			
Number of hours of total student workload (CNPS)					
Form of crediting	crediting with grade				
For group of courses mark (X) final course	X				
Number of ECTS points	5				
including number of ECTS points for practical (P) classes		3			
including number of ECTS points for direct teacher-student contact (BK) classes		3			

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Mathematical Analysis
2. Linear Algebra

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SUBJECT OBJECTIVES

C1 Acquisition of knowledge about dealing with Approximations and evaluation of Error Bounds.
C2 Acquisition of knowledge about Interpolation and Interpolating Polynomials.
C3 Acquisition of knowledge about methods of Numerical Integration
C4 Acquisition of knowledge about methods of Numerical Differentiation
C5 Acquisition of knowledge about methods of solving Nonlinear Equations
C6 Acquisition of knowledge about methods of solving Sets of Linear Equations
C7 Acquisition of knowledge about numerical methods of Matrix Inversion and finding Determinants
C8 Acquisition of knowledge about methods of solving Sets of Nonlinear Equations
C9 Acquisition of knowledge about numerical calculation of Eigenvalues & Eigenvectors
C10 Acquisition of knowledge about Least Square Approximation of Functions
C11Acquisition of knowledge about Fitting Data with a Cubic Spline
C12Acquisition of knowledge about Numerical Solution of Ordinary Differential Equations
C13 Development of skill of handling Approximations and evaluation of Error Bounds.
C14 Development of skill of finding Interpolating Polynomials
C15 Development of skill of using methods of Numerical Integration
C16 Development of skill of using methods of Numerical Differentiation
C17 Development of skill of using methods of solving Nonlinear Equations
C18 Development of skill of using methods of solving Sets of Linear Equations

C19 Development of skill of using numerical methods of Matrix Inversion and finding Determinants
C20 Development of skill of using methods of solving Sets of Nonlinear Equations
C21 Development of skill of using numerical calculation of Eigenvalues & Eigenvectors
C22 Development of skill of using methods for Least Square Approximation of Functions
C23 Development of skill of using methods of Fitting Data with a Cubic Spline
C24 Development of skill of using methods of Numerical Solution of Ordinary Differential Equations

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Knows basic definitions of Approximations and evaluation of Error Bounds
PEK_W02 Knows basic definitions of Interpolation and Interpolating Polynomials
PEK_W03 Knows basic methods of Numerical Integration
PEK_W04 Knows basic methods of Numerical Differentiation
PEK_W05 Knows basic methods of solving Nonlinear Equations
PEK_W06 Knows methods of solving Sets of Linear Equations
PEK_W07 Knows numerical methods of Matrix Inversion and finding Determinants
PEK_W08 Knows basic methods of solving Sets of Nonlinear Equations
PEK_W09 Knows methods of numerical calculation of Eigenvalues & Eigenvectors
PEK_W10 Knows methods for Least Square Approximation of Functions
PEK_W11 Knows methods of Fitting Data with a Cubic Spline
PEK_W12 Knows basic methods of Numerical Solution of Ordinary Differential Equations

relating to skills:

PEK_U01 Can evaluate Errors and Error Bounds
PEK_U02 Can find various Interpolating Polynomials
PEK_U03 Can use basic methods of Numerical Integration
PEK_U04 Can use basic methods of Numerical Differentiation
PEK_U05 Can use basic methods of solving Nonlinear Equations
PEK_U06 Can solve Sets of Linear Equations
PEK_U07 Can use numerical methods of Matrix Inversion and finding Determinants
PEK_U08 Can use basic methods of solving Sets of Nonlinear Equations
PEK_U09 Can calculate numerically Eigenvalues & Eigenvectors of a matrix
PEK_U10 Can find Least Square Approximations of Functions
PEK_U11 Can use methods of Fitting Data with a Cubic Spline
PEK_U12 Can use basic methods of Numerical Solution of Ordinary Differential Equations

relating to social competences:

PEK_K01 Understands the need to use numerical methods in science and engineering.

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Introduction. Errors. Error bounds. Accuracy	2

Lec 2	Interpolation Polynomials	2
Lec 3	Numerical Integration I (Newton-Cotes formulas)	2
Lec 4	Numerical Integration II (Gauss, Adam & Milne formulas)	2
Lec 5	Numerical Differentation	2
Lec 6	Solution of Nonlinear Equations I	2
Lec 7	Solution of Nonlinear Equations II	2
Lec 8.	Solving Sets of Linear Equations	2
Lec 9	Determinant of a Matrix. Matrix Inversion	2
Lec 10	Sets of Nonlinear Equations	2
Lec 11	Numerical Calculation of Eigenvalues & Eigenvectors	2
Lec 12	Least Square Approximation of Functions	2
Lec 13	Fitting Data with a Cubic Spline	2
Lec 14	Numerical Solution of Ordinary Differential Equations I	2
Lec 15	Numerical Solution of Ordinary Differential Equations I	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1	Calculation of Errors, Errors Bounds, Accuracy considerations	2
Cl 2	Forming Difference Tables and Interpolation Polynomials	2
Cl 3	Practical use of Simpson's and other Newton-Coates Formulas	2
Cl 4	Practical use of Gauss, Adam and Milne methods	2
Cl 5	Finding Function Derivatives from Difference Tables	2
Cl 6	Solving Nonlinear Equations by Halving & Other Methods	2
Cl 7	Solving Nonlinear Equations by Newton's & Iteration Methods	2
Cl 8	Practical Use of Gauss-Seidel & Iteration Methods	2
Cl 9	Practical Methods for Finding Determinants and Matrix Inversion	2
Cl 10	Iteration & Newton Methods for Nonlinear Equations	2
Cl 11	Practical Calculation of Eigenvalues & Eigenvectors	2
Cl 12	Approximation of Functions by Various Polynomials	2
Cl 13	Practical Use and Application of Cubic Splines	2
Cl 14	Practical Solving of Ordinary Differential Equations I	2
Cl 15	Practical Solving of Ordinary Differential Equations II	2
	Total Hours	30

TEACHING TOOLS USED
N1. Traditional lecture using board/video projector N2. Tutorial classes N3. Consultations N4. Student's home work

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_U01... PEK_U12	Oral answers, problem solving on board
F2	PEK_W01... PEK_W12	Attendance & activity during classes
F3	PEK_U01... PEK_U12 PEK_W01... PEK_W12	Written test
P = 0,3 * F1 + 0,2 * F2 + 0,5 * F3		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Conte S.C., Carl de Boor, Elementary Numerical Analysis – an algorithmic approach, McGraw-Hill Book Company, New York, 1980

[2] Hoffman Joe D., Numerical Methods for Engineers and Scientists, , McGraw-Hill Book Company, New York, 1992, (Marcel Dekker, Inc. 2001)

SECONDARY LITERATURE:

[1] Won Young Yang, Wenwu Cao, Tae-Sang Chung, John Morris, Applied Numerical Methods using MATLAB, John Wiley & Sons

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

Dr inż. Andrzej Gawrych-Żukowski, andrzej.gawrych-zukowski@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

……Numerical Methods……

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

……Computer Science……..

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)	K1 INF_W01	C1	Lec 1	N1, N3, N4
PEK_W02	K1 INF_W01	C2	Lec 2	N1, N3, N4
PEK_W03	K1 INF_W01	C3	Lec 3, Lec4	N1, N3, N4
PEK_W04	K1 INF_W01	C4	Lec 5	N1, N3, N4
PEK_W05	K1 INF_W01	C5	Lec 6, Lec 7	N1, N3, N4
PEK_W06	K1 INF_W01	C6	Lec 8	N1, N3, N4
PEK_W07	K1 INF_W01	C7	Lec 9	N1, N3, N4
PEK_W08	K1 INF_W01	C8	Lec 10	N1, N3, N4
PEK_W09	K1 INF_W01	C9	Lec 11	N1, N3, N4
PEK_W10	K1 INF_W01	C10	Lec 12	N1, N3, N4
PEK_W11	K1 INF_W01	C11	Lec 13	N1, N3, N4
PEK_W12	K1 INF_W01	C12	Lec 14, Lec15	N2, N3, N4
PEK_U01 (skills)	K1 INF_W06	C13	Cl 1	N2, N3, N4
PEK_U02	K1 INF_W06	C14	Cl 2	N2, N3, N4
PEK_U03	K1 INF_W06	C15	Cl 3, Cl 4	N2, N3, N4
PEK_U04	K1 INF_W06	C16	Cl 5	N2, N3, N4
PEK_U05	K1 INF_W06	C17	Cl 6, Cl 7	N2, N3, N4
PEK_U06	K1 INF_W06	C18	Cl 8	N2, N3, N4
PEK_U07	K1 INF_W06	C19	Cl 9	N2, N3, N4
PEK_U08	K1 INF_W06	C20	Cl 10	N2, N3, N4
PEK_U09	K1 INF_W06	C21	Cl 11	N2, N3, N4
PEK_U10	K1 INF_W06	C22	Cl 12	N2, N3, N4
PEK_U11	K1 INF_W06	C23	Cl 13	N2, N3, N4
PEK_U12	K1 INF_W06	C24	Cl 14, Cl 15	N2, N3, N4
PEK_K01 (competences)	K1 INF_W01, K1 INF_W06	C1...C24	Lec1..15,Cl1...15	N1,N2, N3, N4

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

*** - from table above

Zał. nr 4 do ZW 64/2012

FACULTY OF COMPUTER SCIENCE AND MANAGEMENT / DEPARTMENT

SUBJECT CARD

Name in Polish *Koncepcje i Technologie Biznesu Elektronicznego*
Name in English *E-Business Concept and Technologies*
Main field of study (if applicable): *Computer Science*
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)	30		30		
Number of hours of total student workload (CNPS)	60		90		
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		3		
including number of ECTS points for practical (P) classes	0		2		
including number of ECTS points for direct teacher-student contact (BK) classes	1		1		

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Is able to develop web site/web application.
2.
3.

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SUBJECT OBJECTIVES

C1 To enhance students' knowledge, enterprising creativity and the importance of both, technical and non-technical factors in building successful E-Commerce solutions

C2 To create an environment where students are encouraged and motivated to coin the idea and to start development of a possibly innovative E-Commerce/E-Business solution

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Has a basic knowledge about recent trends in E-Commerce/E-Business markets and how to setup a successful E-Commerce solution

PEK_W02 Has a basic knowledge necessary to understand the importance of non-technical factors in building successful E-Commerce solution

…

relating to skills:

PEK_U01 Is able to discern technical and non-technical aspects in development of an E-Commerce/E-Business solution

PEK_U02 Is able to use her/his creativity to coin the idea and to start development of a possibly innovative E-Commerce/E-Business solution

…

relating to social competences:

PEK_K01 Is able to think and act in an enterprising manner and to use her/his creativity to setup a possibly innovative E-Commerce/E-Business solution

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction to E-Commerce and E-Business	2
Lec 2	Key Principles for Ecommerce Success	2
Lec 3	Get Started: Ecommerce Project Preparation Essentials	2
Lec 4	Get Started: Ecommerce Project Preparation Essentials II	2
Lec 5	Planning Your Website Development and Web Development Environment by Example	2
Lec 6	Introduction to Agile Software Development	2
Lec 7	Agile Software Development	2
Lec 8	Agile Software Development II	2
Lec 10	Get Sales: Key Elements of an Ecommerce Website	2
Lec 11	Get Sales: Key Elements of an Ecommerce Website II	2
Lec 12	Get Hiring	2
Lec 13	Get More Sales	2
Lec 14	Get More Sales II	2
Lec 15	Test	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1		
Cl 2		

Cl 3		
Cl 4		
..		
	Total hours	

Form of classes - laboratory		Number of hours
Lab 1	Introduction, BHP	2
Lab 2	Brainstorming	2
Lab 3	Presentation of the ideas of possibly innovative E-Commerce/E-Business solutions	2
Lab 4	Revisited ideas of possibly innovative E-Commerce/E-Business solutions	2
Lab 5	Setup of project's infrastructure	2
Lab 6	Sprint 1 Iteration 1	2
Lab 7	Sprint 1 Iteration 2	2
Lab 8	Sprint 1 Iteration 3 and sprint demo	2
Lab 9	Sprint 2 Iteration 1	2
Lab 10	Sprint 2 Iteration 2	2
Lab 11	Sprint 2 Iteration 3 and sprint demo	2
Lab 12	Sprint 3 Iteration 1	2
Lab 13	Sprint 3 Iteration 2	2
Lab 14	Sprint 3 Iteration 3 and sprint demo	2
Lab 15	Final assesment	2
	Total hours	30

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lecture
N2. The course web page with references to literature and course related stuff.
N3. Internet and software infrastructure (e.g. versioning repository)

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), C – concluding (at semester end)	Educational effect numer	Way of evaluating educational effect achievement
F1 -	PEK_U01-02, PEK_K01	Evaluation of the proposal of the innovative E-Commerce/E-Business solution [30 points] (Lab1-4)
F2	PEK_U01-02, PEK_K01	Evaluation of the sprint demo 1[20 points] (Lab5-8)
F3	PEK_U01-02, PEK_K01	Evaluation of the sprint demo 2[20 points] (Lab9-11)
F4	PEK_U01-02, PEK_K01	Evaluation of the sprint demo 3[40 points] (Lab12-14)
C1	PEK_U01-02, PEK_K01	C1 is based on the sum of the points from F1…F4: • 5.5 – 91…110 pkt and F2+F4>60 pkt • 5.0 – 91…110 pkt • 4.5 – 81…90 pkt • 4.0 – 71…80 pkt • 3.5 – 61…70 pkt • 3.0 – 51…60 pkt • 2.0 <=50 pkt
C2	PEK_W01	C2 is based on the result of a written test including the material covered during lectures. At least 50% of points is required to pass the test.
C-final mark		C=(2*C1+C2)/3 But if C1=2.0 then C=2.0 as well

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Ian Daniel, E-commerce Get It Right! NeuroDigital 2011, ISBN-13: 978-0956526205
[2] Kenneth C. Laudon, Carol G. Traver, E-commerce business, technology society. Pearson 2012.
[3] Beck, Kent. Wydajne programowanie = Extreme programming, Warszawa:Wydawnictwo MIKOM, 2006.
[5] Henrik Kniberg, Scrum and XP from the Trenches, 2008
[4] Play framework, http://www.playframework.org/

SECONDARY LITERATURE:

[1] Nicolas Leroux and Sietse de Kaper, Play for Java, Manning (Manning Early Access Program), 2012

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT

E-Business Concept and Technologies

AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

Computer Science

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 (knowledge)	T1A_W05, T1A_W02	C1	Lec1-8	N1-2
PEK_W02	T1A_W08, T1A_W02	C1	Lec1-8	N1-2
…				
PEK_U01 (skills)	T1A_U10	C1-2	Lab1-8	N2-3
PEK_U02	K1INF_W14	C1-2	Lab1-8	N2-3
…				
PEK_K01 (competences)	T1A_K06	C1-2	Lab1-8	N2-3
…				

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

*** - from table above