DESCRIPTION OF THE PROGRAM OF STUDIES Zał. nr 3 do ZW 78/2023

Main field of study: Applied Computer Science **Profile:** general academic Attach. no. 2. to the Program of Studies

Level of studies: first-level **Form of studies:** full-time studies

1. General description

1.1 Number of semesters: **7**	*1.2 Total number of ECTS points necessary to complete studies at a given level:* **210**
1.3 Total number of hours: **2505**	*1.4 Prerequisites (particularly for second-level studies):* Qualification is based on the results of the matriculation exam, in accordance with the terms and recruitment procedure established for a given academic year

1.5 Upon completion of studies graduate obtains professional degree of:	*1.6 Graduate profile, employability:*
INŻYNIER (ENGINEER)	A graduate has qualifications including knowledge, skills and engineering competences in the following areas: •Computer architecture and organization and low-level programming of devices, such as elements of the Internet of Things (IoT). •Programming languages, algorithms and data structures, programming paradigms and effective programming techniques. •Computer networks, system administration and cybersecurity. •Databases and data warehouses including database design. •Software design and project management. •Advanced programming methods and tools, artificial intelligence and knowledge engineering, mobile applications and distributed systems. •Various aspects of multimedia •Trends in IT. The graduate also has knowledge of basic sciences: mathematical analysis, algebra with analytical geometry, logic, discrete mathematics, probability and statistics, and physics which are necessary to solve engineering problems and to continue studies at the second degree. An important supplement to the education is knowledge of the basics of entrepreneurship as well as social and professional problems of IT. In addition, the graduate knows English sufficiently to enable him or her to express freely, also in writing, on topics related to the work performed. Soft skills and the ability to work in a team are also important in educating IT engineers. Graduates of the first degree studies in Applied Computer Science may be employed in IT companies and IT departments of banks and financial institutions or enterprises in Wrocław, as well as throughout Poland and even abroad. Graduates are employed as software testers, programmers, designers, service technicians, system administrators and IT security specialists.

1.7 Possibility of continuing studies: Eligibility to apply for admission to second-cycle study programmes, non-degree postgraduate programmes.	*1.8 Indicate connection with University's mission and its development strategy:* Applied Computer Science field of study is in line with the mission and strategy of Wroclaw University of Science and Technology for 2023-30. In particular, it fits into the priority research area: 1. "Information technology, data science and artificial intelligence," which includes, but is not limited to: computer science, algorithmics and software engineering, artificial intelligence and machine learning, human-computer interaction, data analysis and visualization methods, classification and prediction, natural language processing, data storage and transmission engineering, information processing and privacy, cyber security and cryptography, computer and mobile networks, Internet of Things, virtualization, augmented and virtual reality, multimedia techniques, and medical informatics. [Wrocław University of Technology Strategy 2023-2030, p. 17, Priority Research Areas]

2.Detailed description

2.1 Total number of learning outcomes in the program of study:

W (knowledge) = 22, U (skills) = 23, K (competences) = 4, W + U + K = 48

2.2 For the main field of study assigned to more than one discipline - the number of learning outcomes assigned to the discipline:

D1 (major) ..... (this number must be greater than half the total number of learning outcomes)
D2 ……..
D3 ……..
D4 ……..

2.3 For the main field of study assigned to more than one discipline - percentage share of the number of ECTS points for each discipline:

D1 ……. % ECTS points
D2 ……. % ECTS points
D3 ……. % ECTS points
D4 ……. % ECTS points

2.4a. For the general academic profile of the main field of study – the number of ECTS points assigned to the classes related to the University's academic activity in the discipline or disciplines to which the main field of study is assigned – DN (must be greater than 50% of the total number of ECTS points from 1.2)

138	**ECTS**

2.4b. For the practical profile of the main field of study - the number of ECTS points assigned to the classes shaping practical skills (must be greater than 50% of the total number of ECTS points from 1.2)

ECTS

2.5 Concise analysis of compliance of the assumed learning outcomes with the needs of the labor market

The study program is the result of close cooperation with the members of the Social Council of the Faculty of Information and Communication Technology. The Council includes representatives of the management of leading IT companies in the Lower Silesia. The assumed learning outcomes meet the current and prospective needs of the market. In particular, the outcomes meet needs for IT specialists of different companies (e-commerce, service, research) dealing with the maintenance/development of IT tools supporting their activities, developers of IT systems as well as companies designing, implementing and maintaining computer systems and networks.

2.6. The total number of ECTS points that a student must obtain in classes requiring direct participation of academic teachers

122,20	**ECTS**

2.7. Total number of ECTS points, which student has to obtain from basic sciences classes

Number of ECTS points for obligatory subjects	40
Number of ECTS points for optional subjects	0
Number of ECTS points	40

2.8. Total number of ECTS points, which student has to obtain from practical classes, including project and laboratory classes (enter total number of ECTS points for courses/group of courses denoted with code P)

Number of ECTS points for obligatory subjects	69
Number of ECTS points for optional subjects	55
Number of ECTS points	124

2.9. Minimum number of ECTS points, which student has to obtain doing education blocks offered as part of University-wide classes or other main field of study (enter number of ECTS points for courses/groups of courses denoted with code O)

34 ECTS

2.10. Total number of ECTS points, which student may obtain doing optional blocks (min. 30% of total number of ECTS points)

73 ECTS

3. Description of the process leading to learning outcomes acquisition:

The educational process includes active participation in classes organized at the university: lectures, classes, exercises, laboratories, projects and seminars, as well as student's self-learning activities allowing for consolidation, supplementation and extension of knowledge. If necessary, the student can take advantage of individual consultations. The learning outcomes are further developed during mandatory student's internship.

4. List of education blocks:
4.1 List of obligatory blocks:
4.1.1 List of general education blocks

4.1.1.1 *Liberal-managerial subjects* block *(min. 6 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of crediting	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W08IST-SI4002W	Basics of Entrepreneurship	2					KIST_W19	30	50	2		1,40	T	Z				KO
2	W08IST-SI4001S	Presentation Techniques					2	KIST_U18	30	50	2		1,40	T	Z			2	KO
3	W04IST-SI4008W	IT Social and Professional Problems	2					KIST_W20 KIST_W21 KIST_W22	30	50	2		1,40	T	Z				KO
		Total	**4**	**0**	**0**	**0**	**2**	**-**	**90**	**150**	**6**	**0**	**4,20**	**-**	**-**	**-**		**2**	**-**

4.1.1.4 *Information technologies* block *(min. 8 pkt ECTS)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4004G	Computer System Organization (GK)	2	2				KIST_W06	60	75	3		2,40	T	Z (w)			2	PD
2	W04IST-SI4029G	Structural and Object oriented Programming (GK)	2	2				KIST_W03 KIST_U01 KIST_U02	60	75	3		2,60	T	Z			2	PD
3	W04IST-SI4014L	Structural and Object oriented Programming			2			KIST_W03 KIST_U01 KIST_U02	30	50	2		1,40	T	Z			2	PD
		Total	**4**	**4**	**2**	**0**	**0**	**-**	**150**	**200**	**8**	**0**	**6,40**	**-**	**-**	**-**	**0**	**6**	**-**

Altogether for general education blocks

Total number of hours					Total number of ZZU hours	Total number of CNPS Total number of	Total number of ECTS points	Total number of ECTS points for DN classes5	Number of ECTS points for BU classes1
lec	cl	lab	pr	sem					
8	4	2	0	2	240	350	14	0	10,60

4.1.2 List of basic sciences blocks

4.1.2.1 Mathematics block

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W13IST-SI4004G	Linear Algebra with Analytic Geometry A (GK)	2	2				KIST_W01	60	100	4		3,00	T	E (w)	O		2	PD
2	W13IST-SI4005G	Mathematical Analysis I A (GK)	2	2				KIST_W01	60	200	8		3,00	T	E (w)	O		3	PD
3	W13IST-SI4006G	Mathematical Analysis II A (GK)	2	2				KIST_W01	60	175	7		3,00	T	E (w)	O		3	PD
4	W04IST-SI4006G	Discrete Mathematics (GK)	2	2				KIST_W01	60	125	5		2,80	T	Z			3	PD
5	W08IST-SI4007G	Theory of Probabilistic and Statistics (GK)	2	2	1			KIST_W01	75	175	7		3,70	T	E (w)			4	PD
		Total	**10**	**10**	**1**	**0**	**0**	**-**	**315**	**775**	**31**	**0**	**15,50**	**-**	**-**	**-**	**0**	**15**	**-**

4.1.2.2 Physics block

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W11IST-SI4003W	Physics 1 A	2					KIST_W02	30	75	3		1,50	T	E	O			PD
2	W11IST-SI4003C	Physics 1 A		1				KIST_W03	15	50	2		0,70	T	Z	O		2	PD
3	W11IST-SI4004W	Physics 2 B	2					KIST_W02	30	50	2		1,50	T	E	O			PD
4	W11IST-SI4005L	Basic physics laboratory			1			KIST_W03	15	50	2		0,70	T	Z	O		2	PD
		Total	**4**	**1**	**1**	**0**	**0**	**-**	**90**	**225**	**9**	**0**	**4,40**	**-**	**-**	**-**		**4**	-

Altogether for basic sciences blocks:

Total number of hours					Total number of ZZU hours	Total number of CNPS Total number of	Total number of ECTS points	Total number of ECTS points for DN classes5	Number of ECTS points for BU classes1
lec	cl	lab	pr	sem					
14	11	2	0	0	405	1000	40	0	19,90

4.1.3 List of the main field of study blocks

4.1.3.1 *Obligatory main field of study* blocks

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4005G	Logic for IT Specialists (GK)	2	2				KIST_W01	60	125	5	5	2,90	T	Z		DN	2	K
2	W04IST-SI4015L	Data Structures and Algorithms			2			KIST_W03 KIST_U01	30	50	2	2	1,40	T	Z		DN	2	K
3	W04IST-SI4015G	Data Structures and Algorithms (GK)	2	1				KIST_W03 KIST_U02	45	100	4	4	2,80	T	E (w)		DN	1	K
4	W04IST-SI4016W	Computer Architecture	2					KIST_W06 KIST_U04 KIST_U05	30	50	2	2	1,40	T	Z		DN		K
5	W04IST-SI4016L	Computer Architecture			2			KIST_W06 KIST_U04 KIST_U06	30	50	2	2	1,40	T	Z		DN	2	K
6	W04IST-SI4017W	Operating Systems	2					KIST_W08 KIST_U06	30	50	2	2	1,40	T	Z		DN		K
7	W04IST-SI4017L	Operating Systems			2			KIST_W08 KIST_U07	30	50	2	2	1,40	T	Z		DN	2	K
8	W04IST-SI4030G	Computer Networks (GK)	2		2		1	KIST_W09 KIST_U07 KIST_U08	75	175	7	7	3,60	T/Z	E (w)		DN	4	K
9	W04IST-SI4031G	Effective Programming Techniques (GK)	1		2			KIST_W03 KIST_U01 KIST_U02	45	100	4	4	2,20	T/Z	Z		DN	2	K

10	W04IST-SI4032G	Programming paradigms (GK)	2	1	2			KIST_W04 KIST_U02	75	175	7	7	3,70	T/Z(w)	E (w)		DN	4	K
11	W04IST-SI4009L	Data Bases			2			KIST_W12 KIST_U03 KIST_U04	30	50	2	2	1,40	T	Z		DN	2	K
12	W04IST-SI4035G	Data Bases (GK)	2	1				KIST_W12 KIST_U03 KIST_U04	45	125	5	5	2,40	T/Z(w)	E (w)		DN	1	K
13	W04IST-SI4009L	Systems Analysis and Decision Support Methods			1			KIST_W11 KIST_U06	15	25	1	1	0,70	T	Z		DN	1	K
14	W04IST-SI4009G	Systems Analysis and Decision Support Methods (GK)	2	1				KIST_W11 KIST_U06	45	125	5	5	2,30	T/Z(w)	E (w)		DN	2	K
15	W04IST-SI4036W	Introduction to IoT	2					KIST_W09 KIST_U04 KIST_U07	30	75	3	3	1,60	T/Z	E		DN		K
16	W04IST-SI4037L	Introduction to IoT			2			KIST_W09 KIST_U04 KIST_U07	30	50	2	2	1,40	T	Z		DN	2	K
17	W04IST-SI4021L	Basics of Software Engineering			1			KIST_W05 KIST_U03	15	25	1	1	0,80	T	Z		DN	1	K
18	W04IST-SI4021G	Basics of Software Engineering (GK)	1	2				KIST_W05 KIST_U03	45	75	3	3	2,00	T/Z(w)	Z (w)		DN	2	K
19	W04IST-SI4022W	Cybersecurity	2					KIST_W10 KIST_U08	30	75	3	3	1,60	T/Z	E		DN		K
20	W04IST-SI4022L	Cybersecurity			2			KIST_W10 KIST_U08	30	50	2	2	1,40	T	Z		DN	2	K
21	W04IST-SI4034W	Script Languages (GK)	2		2			KIST_W03 KIST_U01	60	125	5	5	2,80	T/Z	Z (w)		DN	3	K
22	W04IST-SI4023W	Software Engineering	2					KIST_W14 KIST_U03 KIST_U04 KIST_U21	30	75	3	3	1,60	T/Z	E		DN		K
23	W04IST-SI4023P	Software Engineering				2		KIST_W14 KIST_U03 KIST_U04 KIST_U21	30	75	3	3	1,60	T	Z		DN	3	K

24	W04IST-SI4024W	Artificial intelligence	2					KIST_W13 KIST_U06	30	50	2	2	1,50	T/Z	E		DN		K
25	W04IST-SI4039L	Artificial intelligence			2			KIST_W13 KIST_U06	30	50	2	2	1,40	T	Z		DN	2	K
26	W04IST-SI4040W	Business Data Modelling and Analysis	2					KIST_W12 KIST_U06	30	50	2	2	1,50	T/Z	E		DN		K
27	W04IST-SI4040L	Business Data Modelling and Analysis			2			KIST_W12 KIST_U06	30	50	2	2	1,40	T	Z		DN	2	K
		Total	**30**	**8**	**26**	**2**	**1**	**-**	**1005**	**2075**	**83**	**83**	**49,60**	**-**	**-**	**-**	**-**	**42**	**-**

Altogether (for main field of study blocks):

Total number of hours					Total number of ZZU hours	Total number of CNPS Total number of	Total number of ECTS points	Total number of ECTS points for DN classes5	Number of ECTS points for BU classes1
lec	cl	lab	pr	sem					
30	8	26	2	1	1005	2075	83	83	49,60

4.2 List of optional blocks

4.2.1 List of general education blocks

4.2.1.2 *Foreign languages* block *(min. 6 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			Univer-sity-wide4	Concerning scientific activities5	Practi-cal6	Type7
1	JZL100707BK	Język obcy A1/A2/B1/B2.1/C1.1/ Foreign language A1/A2/ B1/ B2.1/ C1.1		4				KIST_U19	60	90	3		2,00	T	Z	O		3	KO
2	JZL100708BK	Język obcy B2.2/C1.2/ Foreign language B2.2/C1.2		4				KIST_U19	60	90	3		2,00	T	Z	O		3	KO
		Total	**0**	**8**	**0**	**0**	**0**	**-**	**120**	**180**	**6**	**0**	**4,00**	**-**	**-**	**-**		**6**	**-**

4.2.1.3 Sporting classes block *(0 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			Univer-sity-wide4	Concerning scientific activities5	Practi-cal6	Type7
1	WFW030000BK	Zajęcia sportowe I/ Sports I		2					30	30	0		0,00	T	Z	O			KO
2	WFW030000BK	Zajęcia sportowe II/ Sports II		2					30	30	0		0,00	T	Z	O			KO
		Total	**0**	**4**	**0**	**0**	**0**	**-**	**60**	**60**	**0**	**0**	**0,00**	**-**	**-**	**-**		**0**	**-**

Altogether for general education blocks:

Total number of hours					Total number of ZZU hours	Total number of CNPS Total number of	Total number of ECTS points	Total number of ECTS points for DN classes5	Number of ECTS points for BU classes1
lec	cl	lab	pr	sem					
0	12	0	0	0	180	240	6	0	4,00

4.2.3 List of blocks

4.2.3.1 M1 block - Administration of Computer Systems *(min. 5 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4516G	Linux Server Administration (GK)	2		2			KIST_W08 KIST_U14	60	125	5	5	2,80	T/Z(w)	Z(w)		DN	3	K
2	W04IST-SI4533G	Managing IT infrastructure (GK)	2		2			KIST_W08 KIST_U14	60	125	5	5	2,80	T/Z(w)	Z(w)		DN	3	K
3	W04IST-SI4534G	Routing and Switching in Computer Networks (GK)	2		2			KIST_W08 KIST_U14	60	125	5	5	2,80	T/Z(w)	Z(w)		DN	3	K
		Total	**2**	**0**	**2**	**0**	**0**	**-**	**60**	**125**	**5**	**5**	**2,8**	**-**	**-**	**-**	**-**	**3**	**-**

4.2.3.2 M2 block – Web Technologies *(min. 4 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4518G	Web Systems Programming (GK)	2		2			KIST_W07 KIST_U11	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
2	W04IST-SI4502G	Developing Web Applications with .NET (GK)	2		2			KIST_W07 KIST_U11	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
		Total	**2**	**0**	**2**	**0**	**0**	**-**	**60**	**100**	**4**	**4**	**2,8**	-	**-**	**-**	**-**	**2**	**-**

4.2.3.3 M3 block - Database Design *(min. 4 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4504G	Database Programming (GK)	1			2		KIST_W14 KIST_U03 KIST_U04	45	100	4	4	2,30	T/Z(w)	Z(w)		DN	3	K
2	W04IST-SI4521G	Database Design (GK)	1			2		KIST_W14 KIST_U03 KIST_U04	45	100	4	4	2,30	T/Z(w)	Z(w)		DN	3	K
		Total	**1**	**0**	**0**	**2**	**0**	**-**	**45**	**100**	**4**	**4**	**2,3**	**-**	**-**	**-**	**-**	**3**	**-**

4.2.3.4 M4 block – Mobile applications *(min. 4 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4503G	Mobile applications for Android platform (GK)	2		2			KIST_W07 KIST_U11	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
2	W04IST-SI4504G	Mobile applications for iOS platform (GK)	2		2			KIST_W07 KIST_U11	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
		Total	**2**	**0**	**2**	**0**	**0**	**-**	**60**	**100**	**4**	**4**	**2,8**	**-**	**-**	**-**	**-**	**2**	**-**

4.2.3.5 M5 block – Project Management Basics *(min. 4 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4505G	Introduction to IT Project Management (GK)	1		2		1	KIST_W17 KIST_U09 KIST_U16 KIST_U18	60	100	4	4	3,00	T/Z(w)	Z(w)		DN	3	K
2	W04IST-SI4506G	Support for IT Project Management (GK)	1		2		1	KIST_W17 KIST_U09 KIST_U16 KIST_U18	60	100	4	4	3,00	T/Z(w)	Z(w)		DN	3	K
		Total	**1**	**0**	**2**	**0**	**1**	**-**	**60**	**100**	**4**	**4**	**3,00**	**-**	**-**	**-**	**-**	**3**	**-**

4.2.3.6 M6 block – Distributed Systems *(min. 4 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4508G	Distributed Computer Systems (GK)	2		2			KIST_W07 KIST_U11 KIST_U16	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
2	W04IST-SI4527G	Cloud programming (GK)	2		2			KIST_W07 KIST_U11 KIST_U16	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
		Total	**2**	**0**	**2**	**0**	**0**	**-**	**60**	**100**	**4**	**4**	**2,8**	**-**	**-**	**-**	**-**	**2**	**-**

4.2.3.7 M7 block – Programming Tools and Technologies *(min. 4 ECTS poits)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4511G	Programowanie gier (GK)/ Game Programming (GK)	2		2			KIST_W16 KIST_U13	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
2	W04IST-SI4522G	Advanced Web Technologies (GK)	2		2			KIST_W16 KIST_U13	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
		Total	**2**	**0**	**2**	**0**	**0**	**-**	**60**	**100**	**4**	**4**	**2,8**	**-**	**-**	**0**		**2**	**-**

4.2.3.8 M8 block – Multimedia *(min. 4 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4523G	Grafika komputerowa (GK)/ Computer Graphics (GK)	2		2			KIST_W15 KIST_U12	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
2	W04IST-SI4524G	Programming Multimedia Applications (GK)	2		2			KIST_W15 KIST_U12	6	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
3	W04IST-SI4525G	Digital Media Processing Techniques (GK)	2		2			KIST_W15 KIST_U12	60	100	4	4	2,80	T/Z(w)	Z(w)		DN	2	K
		Tota	**2**	**0**	**2**	**0**	**0**	**-**	**60**	**100**	**4**	**4**	**2,8**	**-**	**-**	**-**	**-**	**2**	**-**

4.2.3.9 M9 block – Current trends in Computer Science *(min. 6 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			University-wide4	Concerning scientific activities5	Practical6	Type7
1	W04IST-SI4535G	Data Science (GK)	2		3			KIST_W18 KIST_U10	75	150	6	6	4,00	T/Z(w)	Z(w)		DN	4	K
2	W04IST-SI4536G	Neural Networks (GK)	2		3			KIST_W18 KIST_U10	75	150	6	6	4,00	T/Z(w)	Z(w)		DN	4	K
3	W04IST-SI453G	Metaheuristics in Problems Solving (GK)	2		3			KIST_W18 KIST_U10	75	150	6	6	4,00	T/Z(w)	Z(w)		DN	4	K
4	W04IST-SI4538G	Human–Computer Interaction (GK)	2		3			KIST_W18 KIST_U10	75	150	6	6	4,00	T/Z(w)	Z(w)		DN	4	K
		Total	**2**	**0**	**3**	**0**	**0**	**-**	**75**	**150**	**6**	**6**	**4**	**-**	**-**	**-**	**-**	**4**	**-**

4.2.3.10 Other elective courses/group of courses *(min. 28 ECTS points)*

No.	Subjet/ group of classes code	Name of subject/group of classes (denote group of courses with symbol GK)	Weekly number of hours					Learning effect symbol	Number of hours		Number of ECTS points			Form2 of subject/group of courses	Way3 of credit-ing	Course/group of courses			
			lec	cl	lab	pr	sem		ZZU	CNPS	Total	DN[5] classes	BU[1] classes			Univer-sity-wide4	Concerning scientific activities5	Practi-cal6	Type7
1	W04IST-SI4041G	Team Project (GK)				8	1	KIST_U10 KIST_U15 KIST_U17 KIST_U20 KIST_U21 KIST_U22 KIST_K01 KIST_K02 KIST_K03 KIST_K04	135	550	22	10	6,00	T	Z			20	K
2	W04IST-SI4038Q	Practical training						KIST_U23	0	180	6	6	6,00	T/Z	Z			6	K
		Total	**0**	**0**	**0**	**8**	**1**	**-**	**135**	**730**	**28**	**16**	**12,00**	**-**	**-**	**-**	**-**	**26**	**-**

Altogether for blocks:

Total number of hours					Total number of ZZU hours	Total number of CNPS Total number of	Total number of ECTS points	Total number of ECTS points for DN classes5	Number of ECTS points for BU classes1
lec	cl	lab	pr	sem					
16	0	17	10	2	675	1705	67	55	38,10

4.3 Training block - concerning principles of training crediting – attachment no. 4)

Opinion of the Faculty Council concerning the rules of crediting training block

Name of training			
Number of ECTS points	**Number of ECTS points for BU1 classes**	**Training crediting mode**	**Code**
6	6	Z (crediting with grade)	

Training duration	**Training objective**
4 weeks	Getting familiar with the functioning of an IT company or IT department. Getting knowledge about the design, programming, testing or implementation of professional IT solutions as well as practical system administration (connection with one or more mandatory courses is necessary). Implementation of typical IT tasks required practical skills and social competences gained so far, with particular focus on group work.

5. Ways of verifying assumed learning outcomes

Form of classes	Ways of verifying assumed learning outcomes
lecture	Examination, progress/final test
class	progress/final test
laboratory	pretest, report from laboratory, assessment of a solution delivered by student during laboratory
project	project defence, project documentation
seminar	participation in discussion, topic presentation, essay
training	report from training

6. Range of diploma examination

Attachment no. 5. to the Program of Studies

7. Requirements concerning deadlines for crediting subject/groups of subject for all courses in particular blocks

Attachment no. 6. to the Program of Studies

8. Plan of studies (attachment no. 3)

Approved by faculty student government legislative body:

.....

Date name and surname, signature of student representative

.....

Date Dean’s signature