

**INFORMATION SCIENCES, speciality Designing IT Systems and Computer Networks**

Educational profile: general academic

2017/18

Form of studies: full-time

Level of qualification: second degree studies

Qualifications gained: second degree studies

Area of education: in science and technological sciences

No.	Name of subject/ module	sem.	ECTS	exam in sem.	Hours in semester									
					lect.	exerc.	lab.	others	self-study	lect.+exer	contact	practical	together	status
<b>General requirements</b>														
1	Ergonomics	1	0,25	zal.	2			0	3	2	2	0	5	o
2	Intellectual property protection	1	0,25	zal.	2			0	3	2	2	0	5	o
3	Etiquette	1	0,5	zal.	4			0	6	4	4	0	10	o
4	Safety and hygiene at work	1	0,5	zal.	4			4	6	4	8	0	14	o
5	Patent information	4	0,5	zal.	4			4	6	4	8	0	14	o
6	Humanity and sociology course 1	1	2	zal_O	30			1	30	30	31	0	61	f
7	Humanity and sociology course 2	3	2	zal_O	30			1	30	30	31	0	61	f
8	Specialized workshop of computer science English	1	2	zal_O		30		1	30	30	31	30	61	o
<b>Subjects for field of study</b>														
1	Distributed systems	1	4,5	Egz.	30		30	3	63	60	63	30	126	o
2	Subject to be chosen 1	1	4,5	Egz.	30		30	2	63	60	62	30	125	f
	Logic for informaticians^													
	Foundations of calculability theory ^													
3	Computer simulation	2	5	zal_O	30		30	3	63	60	63	30	126	o
4	History of computer science	2	1	zal_O	15			0	15	15	15	0	30	o
5	Data security	3	4,5	zal_O	30		30	3	55	60	63	30	118	o
6	Systems of artificial intelligence	4	5	Egz.	30		30	5	60	60	65	30	125	o
7	Quantum algorithms	4	2,5	zal_O	30			5	35	30	35	0	70	o
<b>Subjects for speciality</b>														
1	Advanced object-oriented programming	1	4,5	zal_O	30		30	3	60	60	63	30	123	o

2	Mathematical modeling of systems	1	4,5	Egz.	30	30	5	60	60	65	30	125	o
3	Bolean algebra	1	4,5	Egz.	30	30	5	60	60	65	30	125	o
4	Foundations of management information systems	2	4,5	Egz.	30	30	3	60	60	63	30	123	o
5	Subject to be choosen 2	2	5	Egz.	30	30	5	65	60	65	30	130	f
	Facultative subject^^												
	Automatics and robotics^^												
	Information theory and coding^^												
6	Computer system design	2	4,5	Egz.	30	30	3	60	60	63	30	123	o
7	Computer network design	3	5	Egz.	30	30	5	65	60	65	30	130	o
8	Subject to be choosen 3												
	Advanced computer networks^^^	3	4,5	Egz.	30	30	3	60	60	63	30	123	f
	Mobil systems^^^												
9	Advanced Internet applications	3	5	Egz.	30	30	5	65	60	65	30	130	o
10	Subject to be choosen 4	3	5	Egz.	30	30	5	60	60	65	30	125	f
	Advances data bases systems^^^^												
	R programming^^^^												
	Object oriented data bases^^^^												
<b>Specialising</b>													
1	Seminar for the master's degree 1	1	2	zal_O		30	5	20	30	35	30	55	f
2	Seminar for the master's degree 2	2	2	zal_O		30	5	20	30	35	30	55	f
3	Specialized lecture 1	2	2	zal_O	30		3	20	30	33	0	53	f
4	Seminar for the master's degree 3	3	2	zal_O		30	5	20	30	35	30	55	f
5	Specialized lecture 2	3	2	zal_O	30		3	20	30	33	0	53	f
6	Seminar for the master's degree 4	4	2	zal_O		30	5	20	30	35	30	55	f
<b>Others</b>													
1	Professional practice	2	6	zal_O			52	108	0	52	160	160	f
2	Diploma Thesis	4	20				200	300	0	200	200	500	f

<b>Together:</b>		ECTS	I.egz.	wyk.	kon.	lab.	inne	samodziel	w+ćw	kontakt.	prakt	razem	
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<b>semester 1</b>	<b>1</b>	<b>30</b>	<b>4</b>	192	30	180	29	404	402	431	210	835	
<b>semester 2</b>	<b>2</b>	<b>30</b>	<b>3</b>	165	0	150	74	411	315	389	310	800	
<b>semester 3</b>	<b>3</b>	<b>30</b>	<b>4</b>	210	0	180	30	375	390	420	180	795	
<b>semester 4</b>	<b>4</b>	<b>30</b>	<b>1</b>	64	0	60	219	421	124	343	260	764	
<b>Number of exams/ ECTS</b>		<b>120</b>	<b>12</b>	<b>631</b>	<b>30</b>	<b>570</b>	<b>352</b>	<b>1611</b>	<b>1231</b>	<b>1583</b>	<b>960</b>	<b>3194</b>	

I	ECTS: summary	ECTS		Hours	
			%		%
	<b>Together in plan of studies</b>	120	100%	3194	100%
1	requiring the direct contact with an academic teacher*	59,5	49,6%	1583	49,6%
2	in basic sciences	27	22,5%	720	22,5%
3	of practical nature (laboratories, projects, workshops)	36,1	30,1%	960	30,1%
4	general academic to be realized with another field of study	8	6,7%	231	7,2%
5	Humanity and social subjects	5	4,2%	152	4,8%
6	subjects to be chosen - at least 30% of ECTS	61	50,8%	1611	50,4%
7	Professional practice	6	5,0%	160	5,0%

II	Percentage of ECTS for each field of study in ECTS	%
	<b>field of study</b>	
1	technological sciences	<b>92,4%</b>
2	science	<b>7,6%</b>
	<b>Together % of ECTS</b>	

**Note: applies to graduates of first and second degree of related fields of studies**

in order to apply for second degree studies the student has to possess the diploma of the first degree studies or second degree master studies along with having a title of engineer or master in engineering

After admission for the second degree studies, a student of relational field of studies is obliged to complete all lacking educational effects in category of knowledge, skills and social competences required for the first degree studies. It is possible to complete additional subjects up to 30 ECTS with the first degree students. The student obliged to complete his/her knowledge, abilities and social competences may realize them through individual organization of studies. Possible program differences the student should realize during four semesters of studies.

**Necessary educational effects:**

in the category of knowledge

has knowledge in certain fields of mathematics, including elements of algebra and geometry, analysis, probability and elements of discrete and applied mathematics

has knowledge of physics necessary for understanding the fundamental physical phenomena occurring in electronic and IT elements and systems

has knowledge concerning programming paradigms, in particular methods of structural, object-oriented and declarative programming

has fundamental knowledge of the system architecture and computer networks as well as operating systems

knows and understands the basics of designing, creating and managing database systems

in the category of skills

can design and justify the validity of the computer program, taking into account the complexity of algorithms and present it in a high-level language

can use properly chosen development environments for designing, creating, modifying and managing databases

can make specification of requirements and design elements of information systems, taking into account the given commercial and economic criteria

in the category of social competences

is aware of the importance and understands the non-technical aspects and effects of his/her activities as an engineer/ computer scientist, his/her impact on environment, and related responsibility for decisions taken

can cooperate and work in a group, taking different roles, is aware of responsibility for his/her work and rules in a group

**INFORMATION SCIENCES, speciality: Multimedia Techniques**

Educational profile: general academic

2017/18

Form of studies: full-time

Level of qualification: second degree studies

Qualifications gained: second degree studies

Area of education: in science and technological sciences

No.	Name of subject/ module	sem.	ECTS	exam in sem.	Hours in semester									
					lect.	exerc.	lab.	others	self-study	lect.+exerc	contact	practical	together	status
<b>General requirements</b>														
1	Ergonomics	1	0,25	zal.	2			0	3	2	2	0	5	o
2	Intellectual property protection	1	0,25	zal.	2			0	3	2	2	0	5	o
3	Etiquette	1	0,5	zal.	4			0	6	4	4	0	10	o
4	Safety and hygiene at work	1	0,5	zal.	4			4	6	4	8	0	14	o
5	Patent information	4	0,5	zal.	4			4	6	4	8	0	14	o
6	Humanity and sociology course 1	1	2	zal_O	30			1	30	30	31	0	61	f
7	Humanity and sociology course 2	3	2	zal_O	30			1	30	30	31	0	61	f
8	Specialized workshop of computer science English	1	2	zal_O		30		1	30	30	31	30	61	o
<b>Subjects for field of study</b>														
1	Distributed systems	1	4,5	Egz.	30		30	3	63	60	63	30	126	o
2	Subject to be chosen 1	1	4,5	Egz.	30		30	2	63	60	62	30	125	f
	Logic for informaticians^													
	Foundations of calculability theory ^													
3	Computer simulation	2	5	zal_O	30		30	3	63	60	63	30	126	o
4	History of computer science	2	1	zal_O	15			0	15	15	15	0	30	o
5	Data security	3	4,5	zal_O	30		30	3	55	60	63	30	118	o
6	Systems of artificial intelligence	4	5	Egz.	30		30	5	60	60	65	30	125	o
7	Quantum algorithms	4	2,5	zal_O	30			5	35	30	35	0	70	o
<b>Subjects for speciality</b>														
1	Modeling and visualization of 3d graphics	1	4,5	Egz.	30		30	3	60	60	63	30	123	o

2	Advanced graphics programming systems	1	4,5	zal_O	30	30	5	60	60	65	30	125	o	
3	Subject to be chosen 2	1	4,5	Egz.	30	30	5	60	60	65	30	125	o	
	Mathematical modeling of systems^^													
	Bolean algebra^^													
4	Digital Signal Processing	2	4,5	Egz.	30	30	3	60	60	63	30	123	o	
5	Subject to be chosen 3													
	Facultative subject^^^	2	5	Egz.	30	30	5	65	60	65	30	130	f	
	Data analysis^^^													
	Information theory and coding^^^													
6	Image processing and recognition	2	4,5	Egz.	30	30	3	60	60	63	30	123	o	
7	Multimedia system techniques	3	5	Egz.	30	30	3	60	60	63	30	123	o	
8	Speech signal processing	3	5	Egz.	30	30	5	65	60	65	30	130	o	
9	Advanced numerical methods	3	5	Egz.	30	30	5	65	60	65	30	130	o	
10	Subject to be chosen 4	3	4,5	Egz.	30	30	5	60	60	65	30	125	f	
	Multimedia data bases^^^^													
	R programming^^^^													
	Mobile systems^^^^													
<b>Specialising</b>														
1	Seminar for the master's degree 1	1	2	zal_O		30	5	20	30	35	30	55	f	
2	Seminar for the master's degree 2	2	2	zal_O		30	5	20	30	35	30	55	f	
3	Specialized lecture 1	2	2	zal_O	30		3	20	30	33	0	53	f	
4	Seminar for the master's degree 3	3	2	zal_O		30	5	20	30	35	30	55	f	
5	Specialized lecture 2	3	2	zal_O	30		3	20	30	33	0	53	f	
6	Seminar for the master's degree 4	4	2	zal_O		30	5	20	30	35	30	55	f	
<b>Others</b>														
1	Professional practice	2	6	zal_O				52	108	0	52	160	160	f
2	Diploma Thesis	4	20					200	300	0	200	200	500	f

<b>Together:</b>		ECTS	l.egz.	wyk.	kon.	lab.	inne	amodziel	w+ćw	kontakt.	prakt	razem
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<b>semester 1</b>	<b>1</b>	<b>30</b>	<b>4</b>	192	30	180	29	404	402	431	210	835
<b>semester 2</b>	<b>2</b>	<b>30</b>	<b>3</b>	165	0	150	74	411	315	389	310	800
<b>semester 3</b>	<b>3</b>	<b>30</b>	<b>4</b>	210	0	180	30	375	390	420	180	795
<b>semester 4</b>	<b>4</b>	<b>30</b>	<b>1</b>	64	0	60	219	421	124	343	260	764
<b>Number of exams/ ECTS</b>		<b>120</b>	<b>12</b>	<b>631</b>	<b>30</b>	<b>570</b>	<b>352</b>	<b>1611</b>	<b>1231</b>	<b>1583</b>	<b>960</b>	<b>3194</b>

I	ECTS: summary	ECTS		Hours	
			%		%
	<b>Together in plan of studies</b>	120	100%	3194	100%
1	requiring the direct contact with an academic teacher*	59,5	49,6%	1583	49,6%
2	in basic sciences	27	22,5%	720	22,5%
3	of practical nature (laboratories, projects, workshops)	36,1	30,1%	960	30,1%
4	general academic to be realized with another field of study	8	6,7%	231	7,2%
5	Humanity and social subjects	5	4,2%	152	4,8%
6	subjects to be chosen - at least 30% of ECTS	56	46,7%	1488	46,6%
7	Professional practice	6	5,0%	160	5,0%

II	Percentage of ECTS for each field of study in ECTS	%
	<b>field of study</b>	
1	technological sciences	<b>92,1%</b>
2	science	<b>7,9%</b>
	<b>Together % of ECTS</b>	

**Note: applies to graduates of first and second degree of related fields of studies**

in order to apply for second degree studies the student has to possess the diploma of the first degree studies or second degree master studies along with having a title of engineer or master in engineering

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**Necessary educational effects:**

in the category of knowledge

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has knowledge of physics necessary for understanding the fundamental physical phenomena occurring in electronic and IT elements and systems

has knowledge concerning programming paradigms, in particular methods of structural, object-oriented and declarative programming

has fundamental knowledge of the system architecture and computer networks as well as operating systems

knows and understands the basics of designing, creating and managing database systems

in the category of skills

can design and justify the validity of the computer program, taking into account the complexity of algorithms and present it in a high-level language

can use properly chosen development environments for designing, creating, modifying and managing databases

can make specification of requirements and design elements of information systems, taking into account the given commercial and economic criteria

in the category of social competences

is aware of the importance and understands the non-technical aspects and effects of his/her activities as an engineer/ computer scientist, his/her impact on environment, and related responsibility for decisions taken

can cooperate and work in a group, taking different roles, is aware of responsibility for his/her work and rules in a group

**INFORMATION SCIENCES, speciality: Bioinformatics**

Educational profile: general academic

2017/18

Form of studies: full-time

Level of qualification: second degree studies

Qualifications gained: second degree studies

Area of education: in science and technological sciences

No.	Name of subject/ module	sem.	ECTS	exam in sem.	Hours in semester									
					lect.	exerc.	lab.	others	self-study	lect.+exerc	contact	practical	together	status
<b>General requirements</b>														
1	Ergonomics	1	0,25	zal.	2			0	3	2	2	0	5	o
2	Intellectual property protection	1	0,25	zal.	2			0	3	2	2	0	5	o
3	Etiquette	1	0,5	zal.	4			0	6	4	4	0	10	o
4	Safety and hygiene at work	1	0,5	zal.	4			4	6	4	8	0	14	o
5	Patent information	4	0,5	zal.	4			4	6	4	8	0	14	o
6	Humanity and sociology course 1	1	2	zal_O	30			1	30	30	31	0	61	f
8	Specialized workshop of computer science English	1	2	zal_O		30		1	30	30	31	30	61	o
<b>Subjects for field of study</b>														
1	Distributed systems	1	4,5	Egz.	30		30	3	63	60	63	30	126	o
2	Subject to be choosen 1	1	4,5	Egz.	30		30	2	63	60	62	30	125	f
	Logic for informaticians <sup>^</sup>													
	Foundations of calculability theory <sup>^</sup>													
3	Computer simulation	2	5	zal_O	30		30	3	63	60	63	30	126	o
4	History of computer science	2	1	zal_O	15			0	15	15	15	0	30	o
5	Data security	3	4,5	zal_O	30		30	3	55	60	63	30	118	o
6	Systems of artificial intelligence	4	5	Egz.	30		30	5	60	60	65	30	125	o
7	Quantum algorithms	4	2,5	zal_O	30			5	35	30	35	0	70	o
<b>Subjects for speciality</b>														
1	Molecular biophysics	1	4,5	Egz.	30		30	3	64	60	63	30	127	o

2	Application of computer tools in biology	1	3	zal_O	15		30	1	43	45	46	30	89	o
3	Introduction to molecular biology	1	3	Egz.	15		30	1	43	45	46	30	89	o
4	Methodology of experimental work	1	3	zal_O	15		30	1	43	45	46	30	89	o
5	Systems biology	2	4,5	Egz.	30		30	2	63	60	62	30	125	o
4	Introduction to molecular modelling	2	5	Egz.	30		30	3	63	60	63	30	126	o
5	Image processing and recognition	2	4,5	Egz.	30		30	2	60	60	62	30	122	o
6	Advanced techniques of molecular biology	3	5	Egz.	30		30	3	60	60	63	30	123	o
7	Structural bioinformatics	3	5	Egz.	30		30	3	63	60	63	30	126	o
8	Bid Data analysis	3	4,5	Egz.	30		30	3	60	60	63	30	123	o
9	Research project	3	2	zal_O			30	2	21	30	32	30	53	o
10	Subject to be choosen 4	3	5	Egz.	30		30	3	63	60	63	30	126	f
	Advances data bases systems^^^^													
	R programming^^^^													
	Object oriented data bases^^^^													

**Specialising**

1	Seminar for the master's degree 1	1	2	zal_O			30	5	20	30	35	30	55	f
2	Seminar for the master's degree 2	2	2	zal_O			30	5	20	30	35	30	55	f
3	Specialized lecture 1	2	2	zal_O	30			3	20	30	33	0	53	f
4	Seminar for the master's degree 3	3	2	zal_O			30	5	20	30	35	30	55	f
5	Specialized lecture 2	3	2	zal_O	30			3	20	30	33	0	53	f
6	Seminar for the master's degree 4	4	2	zal_O			30	5	20	30	35	30	55	f

**Others**

1	Professional practice	2	6	zal_O				52	108	0	52	160	160	f
2	Diploma Thesis	4	20					200	300	0	200	200	500	f

<b>Together:</b>		ECTS	l.egz.	wyk.	kon.	lab.	inne	amodzieln	w+ćw	kontakt.	prakt	razem
<b>semester 1</b>	1	30	4	177	30	210	22	417	417	439	240	856
<b>semester 2</b>	2	30	3	165	0	150	70	412	315	385	310	797
<b>semester 3</b>	3	30	4	180	0	210	25	362	390	415	210	777
<b>semester 4</b>	4	30	1	64	0	60	219	421	124	343	260	764
<b>Number of exams/ ECTS</b>		<b>120</b>	<b>12</b>	<b>586</b>	<b>30</b>	<b>630</b>	<b>336</b>	<b>1612</b>	<b>1246</b>	<b>1582</b>	<b>1020</b>	<b>3194</b>

I ECTS:

ECTS

Hours

II

Percentage of ECTS

summary		%		%
<b>Together in plan of studies</b>	120	100%	3194	100%
1 requiring the direct contact with an academic teacher*	59,4	49,5%	1582	49,5%
2 in basic sciences	27	22,5%	720	22,5%
3 of practical nature (laboratories, projects, workshops)	38,3	31,9%	1020	31,9%
4 general academic to be realized with another field of study	6	5,0%	170	5,3%
5 Humanity and social subjects	5	4,2%	144	4,5%
6 subjects to be chosen - at least 30% of ECTS	49,5	41,3%	1298	40,6%
7 Professional practice	6	5,0%	160	5,0%

for each field of study in ECTS	%
<b>field of study</b>	
1 technological sciences	<b>94,5%</b>
2 science	<b>5,5%</b>
<b>Together % of ECTS</b>	

**Note: applies to graduates of first and second degree of related fields of studies**

in order to apply for second degree studies the student has to possess the diploma of the first degree studies or second degree master studies along with having a title of engineer or master in engineering

After admission for the second degree studies, a student of relational field of studies is obliged to complete all lacking educational effects in category of knowledge, skills and social competences required for the first degree studies. It is possible to complete additional subjects up to 30 ECTS with the first degree students. The student obliged to complete his/her knowledge, abilities and social competences may realize them through individual organization of studies. Possible program differences the student should realize during four semesters of studies.

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in the category of knowledge

has knowledge in certain fields of mathematics, including elements of algebra and geometry, analysis, probability and elements of discrete and applied mathematics

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in the category of skills

can design and justify the validity of the computer program, taking into account the complexity of algorithms and present it in a high-level language

can use properly chosen development environments for designing, creating, modifying and managing databases

can make specification of requirements and design elements of information systems, taking into account the given commercial and economic criteria

in the category of social competences

is aware of the importance and understands the non-technical aspects and effects of his/her activities as an engineer/ computer scientist, his/her impact on environment, and related responsibility for decisions taken

can cooperate and work in a group, taking different roles, is aware of responsibility for his/her work and rules in a group

# INFORMATION SCIENCES, speciality Designing IT Systems and Computer Networks

Educational profile: general academic

2017/18

Form of studies: full-time

Level of qualification: second degree studies

Qualifications gained: second degree studies

Area of education: in science and technological sciences

<b>Semester 1</b>		ECTS		lect.	exerc.	lab.
1	Ergonomics	0,25	zal.	2		
2	Intellectual property protection	0,25	zal.	2		
3	Etiquette	0,5	zal.	4		
4	Safety and hygiene at work	0,5	zal.	4		
5	Humanity and sociology course 1	2	zal_O	30		
6	Specialized workshop of computer science English	2	zal_O		30	
7	Distributed systems	4,5	Egz.	30		30
8	Subject to be chosen 1	4,5	Egz.	30		30
	Logic for informaticians <sup>^</sup>					
	Foundations of calculability theory <sup>^</sup>					
9	Advanced object-oriented programming	4,5	zal_O	30		30
10	Mathematical modeling of systems	4,5	Egz.	30		30
11	Bolean algebra	4,5	Egz.	30		30
12	Seminar for the master's degree 1	2	zal_O			30

<b>Semester 2</b>		ECTS		lect.	exerc.	lab.
2	Computer simulation	5	zal_O	30		30
3	History of computer science	1	zal_O	15		
4	Foundations of management information systems	4,5	Egz.	30		30
5	Subject to be chosen 2	5	Egz.	30		30
	Facultative subject <sup>^^</sup>					
	Automatics and robotics <sup>^^</sup>					
	Information theory and coding <sup>^^</sup>					
6	Computer system design	4,5	Egz.	30		30
7	Seminar for the master's degree 2	2	zal_O			30
8	Specialized lecture 1	2	zal_O	30		
9	Professional practice	6	zal_O			

<b>Semester 3</b>		ECTS		lect.	exerc.	lab.
1	Humanity and sociology course 2	2	zal_O	30		
2	Data security	4,5	zal_O	30		30
3	Computer network design	5	Egz.	30		30
4	Subject to be chosen 3	4,5	Egz.	30		30
	Advanced computer networks <sup>^^^</sup>					
	Mobil systems <sup>^^^</sup>					
5	Advanced Internet applications	5	Egz.	30		30
6	Subject to be chosen 4	5	Egz.	30		30
	Advances data bases systems <sup>^^^^</sup>					
	R programming <sup>^^^^</sup>					
	Object oriented data bases <sup>^^^^</sup>					
7	Seminar for the master's degree 3	2	zal_O			30
8	Specialized lecture 2	2	zal_O	30		

**Semester 4**

		ECTS		lect.	exerc.	lab.
1	Patent information	0,5	zal.	<b>4</b>		
2	Systems of artificial intelligence	5	Egz.	<b>30</b>		<b>30</b>
3	Quantum algorithms	2,5	zal_O	<b>30</b>		
4	Seminar for the master's degree 4	2	zal_O			<b>30</b>
5	Diploma Thesis	20				

# INFORMATION SCIENCES, speciality: Multimedia Techniques

Educational profile: general academic

2017/18

Form of studies: full-time

Level of qualification: second degree studies

Qualifications gained: second degree studies

Area of education: in science and technological sciences

## Semester 1

		ECTS		lect.	exerc.	lab.
1	Ergonomics	0,25	zal.	2		
2	Intellectual property protection	0,25	zal.	2		
3	Etiquette	0,5	zal.	4		
4	Safety and hygiene at work	0,5	zal.	4		
5	Humanity and sociology course 1	2	zal_O	30		
6	Specialized workshop of computer science English	2	zal_O		30	
7	Distributed systems	4,5	Egz.	30		30
8	Subject to be choosen 1	4,5	Egz.	30		30
	Logic for informaticians <sup>^</sup>					
	Foundations of calculability theory <sup>^</sup>					
9	Modeling and visualization of 3d graphics	4,5	Egz.	30		30
10	Advanced graphics programming systems	4,5	zal_O	30		30
11	Subject to be choosen 2	4,5	Egz.	30		30
	Mathematical modeling of systems <sup>^^</sup>					
	Bolean algebra <sup>^^</sup>					
12	Seminar for the master's degree 1	2	zal_O			30

## Semester 2

		ECTS		lect.	exerc.	lab.
2	Computer simulation	5	zal_O	30		30
3	History of computer science	1	zal_O	15		
4	Digital Signal Processing	4,5	Egz.	30		30
5	Subject to be choosen 3					
	Facultative subject <sup>^^^</sup>	5	Egz.	30		30
	Data analysis <sup>^^^</sup>					
	Information theory and coding <sup>^^^</sup>					
6	Image processing and recognition	4,5	Egz.	30		30
7	Seminar for the master's degree 2	2	zal_O			30
8	Specialized lecture 1	2	zal_O	30		
9	Professional practice	6	zal_O			

## Semester 3

		ECTS		lect.	exerc.	lab.
1	Humanity and sociology course 2	2	zal_O	30		
2	Data security	4,5	zal_O	30		30
3	Multimedia system techniques	5	Egz.	30		30
4	Speech signal processing	5	Egz.	30		30
5	Advanced numerical methods	5	Egz.	30		30
6	Subject to be choosen 4	4,5	Egz.	30		30
	Multimedia data bases <sup>^^^^</sup>					
	R programming <sup>^^^^</sup>					
	Mobil systems <sup>^^^^</sup>					
7	Seminar for the master's degree 3	2	zal_O			30
8	Specialized lecture 2	2	zal_O	30		

**Semester 4**

		ECTS		lect.	exerc.	lab.
1	Patent information	0,5	zal.	<b>4</b>		
2	Systems of artificial intelligence	5	Egz.	<b>30</b>		<b>30</b>
3	Quantum algorithms	2,5	zal_O	<b>30</b>		
4	Seminar for the master's degree 4	2	zal_O			<b>30</b>
5	Diploma Thesis	20				

## INFORMATION SCIENCES, speciality: Bioinformatics

Educational profile: general academic

2017/18

Form of studies: full-time

Level of qualification: second degree studies

Qualifications gained: second degree studies

Area of education: in science and technological sciences

### Semester 1

	ECTS		lect.	exerc.	lab.
1	Ergonomics	0,25	zal.	2	
2	Intellectual property protection	0,25	zal.	2	
3	Etiquette	0,5	zal.	4	
4	Safety and hygiene at work	0,5	zal.	4	
5	Humanity and sociology course 1	2	zal_O	30	
6	Specialized workshop of computer science English	2	zal_O		30
7	Distributed systems	4,5	Egz.	30	30
8	Subject to be chosen 1	4,5	Egz.	30	30
8a	Logic for informaticians^				
8b	Foundations of calculability theory ^				
9	Molecular biophysics	4,5	Egz.	30	30
10	Application of computer tools in biology	3	zal_O	15	30
11	Introduction to molecular biology	3	Egz.	15	30
11	Methodology of experimental work	3	zal_O	15	30
12	Seminar for the master's degree 1	2	zal_O		30

### Semester 2

	ECTS		lect.	exerc.	lab.
2	Computer simulation	5	zal_O	30	30
3	History of computer science	1	zal_O	15	
4	Systems biology	4,5	Egz.	30	30
5	Introduction to molecular modelling	5	Egz.	30	30
6	Image processing and recognition	4,5	Egz.	30	30
7	Seminar for the master's degree 2	2	zal_O		30
8	Specialized lecture 1	2	zal_O	30	
9	Professional practice	6	zal_O		

### Semester 3

	ECTS		lect.	exerc.	lab.
1	Data security	4,5	zal_O	30	30
2	Advanced techniques of molecular biology	5	Egz.	30	30
3	Structural bioinformatics	5	Egz.	30	30
4	Bid Data analysis	4,5	Egz.	30	30
5	Research project	2	zal_O		30
6	Subject to be chosen 4	5	Egz.	30	30
	Advances data bases systems^^^^				
	R programming^^^^				
	Object oriented data bases^^^^				
7	Seminar for the master's degree 3	2	zal_O		30
8	Specialized lecture 2	2	zal_O	30	

### Semester 4

	ECTS		lect.	exerc.	lab.
1	Patent information	0,5	zal.	4	
2	Systems of artificial intelligence	5	Egz.	30	30
3	Quantum algorithms	2,5	zal_O	30	
4	Seminar for the master's degree 4	2	zal_O		30
5	Diploma Thesis	20			

