

30	Fundamentals of 3D engine programming	C	60	30		30			4										30	30	4									
31	Swarm intelligent systems	C	30	15		15			3										15	15	3									
32	Introduction to game theory	C	30	15		15			3										15	15	3									
33	Introduction to shaders	E	45	15		30			4										15	30	4									
34	Designing and game managing	C	45	30		15			4													30	15	4						
35	Physical processes simulation	C	45	15		30			4													15	30	4						
36	Introduction to HDR technology	E	45	15		30			4													15	30	4						
37	Programming in DirectX library	E	45	15		30			4													15	30	4						
38	3D modeling	C	30	0		30			4														30	4						
39	Team project	C	30	0		30			4														30	4						
40	Interaction design in 3D engine	C	45	15		30			3																15	30	3			
41	Game creation in network space	C	45	15		30			3																15	30	3			
Total B:			1545	645	15	885	0	0	133	75	90	15	90	90	15	135	150	23	105	180	24	135	165	26	75	165	24	30	60	6

Faculty of Computer Science and material Science
Discipline: Computer Science

two-year master's studies
 full-time studies
 valid for academic year **2014/2015**

B PROFESSIONAL COURSES

No.	Course name	E/C	Total	incl.					Total ECTS	I year						II year							
				lectures	class.ex.	laborat.	conver.	semin.		sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks			sem. 4 15 weeks				
										lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS		
1	System modeling and analysis	E	50	20		30			6	20	30	6											
2	Analysis of algorithms and their numerical complexity	C	60	30		30			5				30	30	5								
3	Object-oriented programming	E	60	30		30			6	30	30	6											
4	Image processing	C	50	20		30			6	20	30	6											
5	Programmable control	C	45	15		30			5	15	30	5											
6	Network resources - management and protection	C	45	30		15			5				30	15	5								
7	Personal data protection	C	30	15	15				4				15	15	4								
8	Modern Internet applications	E	50	20		30			6	20	30	6											
9	Monographic lecture I	C	20	20					4				20		4								
9	Monographic lecture II	C	20	20					4					20		4							
9	Monographic lecture III	C	20	20					4									20				4	
10	Optional courses		360	180		180			30				90	90	10	60	60	15	30	30		5	
Total B:			810	420	15	375	0	0	85	105	150	29	185	150	28	80	60	19	50	30		9	

C OTHER

No.	Course name	E/C	Total	incl.					Total ECTS	I year						II year								
				lectures	class.ex.	laborat.	conver.	semin.		sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks			sem. 4 15 weeks					
										lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS			
11	Physical education	C	30		30				1		30	1												
12	Master's laboratory I	C	30			30			5								30	5						
13	Master's laboratory II	C	30			30			5												30	5		
14	Master's seminar I	C	15					15	2					15	2									
15	Master's seminar II	C	30					30	6								30	6						
16	Master's seminar III master's thesis preparation	C	45					45	16												45	16		
Total C:			180		30	60		90	35	0	30	1	0	15	2	0	60	11	0	75	21			
Total sem. (B+C)			990	420	45	435		90	120	285	30	350	30	200	30	155	30							
Total annually										635						355								
TOTAL										990														

Faculty of Computer Science and material Science
Discipline: Computer Science
Specialty: Bioinformatics

two-year master's studies

full-time studies

valid for academic year **2014/2015**

B PROFESSIONAL COURSES

No.	Course name	E/C	Total	incl.					Total ECTS	I year			II year								
				lectures	class.ex.	laborat.	conver.	semin.		sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks			sem. 4 15 weeks		
										lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS
1	Object-oriented programming	E	60	30		30			6	30	30	6									
2	Programmable control	C	45	15		30			5	15	30	5									
3	Modern Internet applications	E	50	20		30			5	20	30	5									
4	System modeling and analysis	E	50	20		30			6	20	30	6									
5	Analysis of algorithms and their numerical complexity	C	60	30		30			5				30	30	5						
6	Network resources - management and protection	C	45	30		15			4				30	15	5						
7	Personal data protection	C	30	15	15				4				15	15	4						
8	Monographic lecture I	C	20	20					4				20		4						
9	Monographic lecture II	C	20	20					4							20		4			
10	Monographic lecture III	C	20	20					4										20		4
11	Image processing	C	50	20		30			6	20	30	6									

12	Basics of molecular biology and genetics	E	60	45		15			4				45	15	4						
13	Methods and technics of molecular biotechnology	E	30	15		15			2				15	15	2						
14	Script languages	E	60	15		45			4				15	45	4						
15	Graphic elements and 3D modeling	C	45	15		30			3							15	30		3		
16	Introduction to bioinformatics	E	45	15		30			3							15	30		3		
17	Bioinformatics databases	C	15	0		15			2								15		2		
18	Specialist computer software	C	30	0		30			3								30		3		
19	Basics of biostatistics with elements of data mining	E	30	15		15			3							15	15		3		
20	Specialist project I	C	15	0			15		1								15		1		
21	Specialist project II	C	30	0			30		5											30	5
Total B:			810	360	15	390	45	0	85	105	150	29	170	135	28	65	135	19	20	30	9

C OTHER

No.	Course name	E/C	Total	incl.					Total ECTS	I year			II year								
				lectures	class.ex.	laborat.	conver.	semin.		sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks			sem. 4 15 weeks		
										lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS
22	Physical education	C	30		30				1		30	1									
23	Master's laboratory I	C	30			30			5							30	5				
24	Master's laboratory II	C	30			30			5										30	5	
25	Master's seminar I	C	15					15	2				15	2							
26	Master's seminar II	C	30					30	6						30	6					
27	Master's seminar III master's thesis preparation	C	45					45	16										45	16	
Total C:			180		30	60		90	35	0	30	1	0	15	2	0	60	11	0	75	21
Total sem. (B+C)			990	360	45	450	45	90	120	285	30	320	30	260	30	125	30				
Total annually									605						385						
TOTAL									990												

C OTHER

No.	Course name	E/C	Total	incl.					Total ECTS	I year						II year								
				lectures	class.ex.	laborat.	conver.	semin.		sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks			sem. 4 15 weeks					
										lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS			
16	Physical education	C	30		30				1		30	1												
17	Master's laboratory I	C	30			30			5								30	5						
18	Master's laboratory II	C	30			30			5												30	5		
19	Master's seminar I	C	15					15	2					15	2									
20	Master's seminar II	C	30					30	6								30	6						
21	Master's seminar III master's thesis preparation	C	45					45	16													45	16	
Total C:			180		30	60		90	35	0	30	1	0	15	2	0	60	11	0	75	21			
Total sem. (B+C)			960	375	45	450		90	120	285	30	290	30	245	30	140	30							
Total annually									575						385									
TOTAL									960															

14	Methods of data analysis	E	45	15		30			6						15	30	6				
15	Multiresolution image analysis	E	60	15		45			7						15	45	7				
16	Specialization project I, II	C	60			60			6							30	3		30	3	
Total B:			765	225	0	360	180	0	87	90	180	29	75	165	29	45	135	22	15	60	7

C OTHER										I year						II year						
										sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks			sem. 4 15 weeks			
										lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	lect.	class.ex.	ECTS	
No.	Course name	E/C	Total	incl.					Total ECTS													
				lectures	class.ex.	laborat.	conver.	semin.														
16	Physical education	C	30		30				1		30	1										
17	English Language Course I, II	C	45				45		3							15	1		30	2		
18	Master's laboratory I	C	30			30			3						30	3						
19	Master's laboratory II	C	30			30			3									30	3			
20	Master's seminar I	C	15					15	1				15	1								
21	Master's seminar II	C	30					30	4						30	4						
22	Master's seminar III master's thesis preparation	C	45					45	18									45	18			
Total C:			225		30	60	45	90	33	0	30	1	0	15	2	0	60	11	0	75	21	
Total sem. (B+C)			990	225	30	420	225	90	120	300	30	255	30	255	30	180	30					
Total annually										555						435						
TOTAL										990												

**Faculty of Computer Science and
Material Science**
Discipline: Computer Science

one-and-half-year master's studies

full-time studies

valid for academic year 2014/2015

A General Courses

No	Course name	E/Z	Total	incl.					Total ECTS	I year						II year		
				sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks								
						ECTS				ECTS			ECTS					
1			0						0	0	0	0	0	0	0	0	0	
RAZEM B:			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

B Professional Courses

No	Course name	E/Z	Total	incl.					Razem ECTS	I year						II year		
				sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks								
				Lectures	Class ex.	Laborat.	Convers.	Seminar.		Lect.	Class lab.	ECTS	Lect.	Class lab.	ECTS	Lect.	Class lab.	ECTS
1	Programming paradigms	E	60	30		30			5	30	30	5						
2	Advanced algorithms and data structures	E	60	30		30			5	30	30	5						
3	Development and configuration of computer networks	Z	30	10		20			2				10	20	2			
4	Courses in education paths *		525	195		330			30	120	120	13	45	120	10	30	90	7
5	Optional courses I, II, III, IV **		180	60		120			12				45	90	9	15	30	3
			855	325	0	530	0	0	54	180	180	23	100	230	21	45	120	10

C Other

No	Course name	E/Z	Total	incl.					Razem ECTS	I year						II year		
				Lectures	Class ex.	Laborat.	Convers.	Seminar.		sem. 1 15 weeks			sem. 2 15 weeks			sem. 3 15 weeks		
										Lect.	Class lab.	ECTS	Lect.	Class lab.	ECTS	Lect.	Class lab.	ECTS
1	Physical education	Z	30		30				1					30	1			
2	Industrial property protection	Z	30	10		20			3	10	20	3						
3	Managing project teams	Z	30	10		20			2				10	20	2			
4	Management of IT projects	Z	30	10		20			2							10	20	2
5	Master's laboratory I	Z	30			30			3					30	3			
6	Master's laboratory II	Z	30			30			4								30	4
7	Master's seminar I	Z	15					15	4		15	4						
8	Master's seminar II	Z	30					30	3					30	3			
9	Master's seminar III master's thesis preparation	Z	45					45	14								45	14
Total C:			270	30	30	120	0	90	36	10	35	7	10	110	9	10	95	20
RAZEM SEMESTRY (A+B+C)			1125	355	30	650	0	90	90	405	30	450	30	270	30			
OGÓLEM									1125									

