STUDY PROGRAM IN COMPUTER SCIENCE AT THE FACULTY OF COMPUTER SCIENCE, UGD–STIP
4 YEARS (240 ECTS)

A student who completes the first cycle of the four-year studies, study program in Computer Science, obtains the following degree:

In English: **Bachelor in Computer Science, VI A (NQF)**

STRUCTURE OF THE STUDY PROGRAM IN COMPUTER SCIENCE ACADEMIC FOUR-YEAR FIRST-CYCLE STUDIES

Courses, 1 year - 1 semester

No.	Code	Courses	ECTS	Hours	Total
1.	2FI100521	Calculus 1	8	3+2+2	240
2.	2FI100221	Fundamentals of computer programming	6	2+2+1	180
3.	2FI100421	Introduction to Informatics	6	2+2+1	180
4.	2FI100621	Linear Algebra with Analytic Geometry	6	2+2+1	180
5.		Elected subject from list No.1	4	2+1+1	120
		Total ECTS	**30**	**11+9+6**	**900**

List No. 1 of elective subjects (choose one of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	4FF100721	Macedonian language 1	4	2+1+1	120
2.	4FF100621	English language level A2.1	4	2+1+1	120
3.	4FF100221	German language level A1.1	4	2+1+1	120
4.	4FF100421	Italian language level A1.1	4	2+1+1	120
5.	4FF100121	Spanish language level A1.1	4	2+1+1	120
6.	4FF100521	French language level A1.1	4	2+1+1	120
7.	4FF100321	Russian language level A1.1	4	2+1+1	120

Courses, 1 year - 2 semester

No.	Code	Courses	ECTS	Hours	Total
1.	2FI101521	Calculus 2	6	2+2+1	180
2.	2FI101221	Object-oriented Programming	6	2+2+1	180
3.	2FI101321	Computer Electronic Components	6	2+2+1	180
4.	2FI101421	Discrete Mathematics	6	2+2+1	180
5.		Elected subject from list No.2	4	2+1+1	180
6.	2SC100121	Sport and recreation			
		Total ECTS	**30**	**10+9+7**	**900**

List No. 2 of elective subjects (choose one of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	4FF101421	Macedonian language 2	4	2+1+1	120
2.	4FF101121	English language level A2.2	4	2+1+1	120
3.	4FF101221	German language level A1.2	4	2+1+1	120
4.	4FF100921	Italian language level A1.2	4	2+1+1	120

5.	4FF100821	Spanish language level A1.2	4	2+1+1	120
6.	4FF101021	French language level A1.2	4	2+1+1	120
7.	4FF101321	Russian language level A1.2	4	2+1+1	120

Courses, 2 year - 3 semester

No.	Code	Courses	ECTS	Hours	Total
1.	2FI101921	Data Structures and Algorithms	8	3+2+2	240
2.	2FI102021	Software Engineering	8	3+2+2	240
3.	2FI102121	Digital Logic	6	2+2+1	180
4.		Elected subject from list No.3	4	2+1+1	120
5.		Elected subject from list No.4	4	2+1+1	120
		Total ECTS	**30**	**12+8+7**	**900**

List No. 3 of elective subjects (choose one of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	2FI130121	Theory of Probability	4	2+1+1	120
2.	2FI130221	Probability and Statistics	4	2+1+1	120

List No. 4 of elective subjects (choose one of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	2FI130521	Geometric Transformations	4	2+1+1	120
2.	2FI130421	Professional Skills	4	2+1+1	120

Courses, 2 year - 4 semester

No.	Code	Courses	ECTS	Hours	Total
1.	2FI102421	Operating Systems	6	2+2+1	180
2.	2FI102521	Database Systems	6	2+2+1	180
3.	2FI102621	Visual Programming	6	2+2+1	180
4.	2FI102721	Computer Networks	6	2+2+1	180
5.		Elected subject from list No.5	4	2+1+1	180
		Total ECTS	**30**	**10+9+7**	**900**

List No. 5 of elective subjects (choose one of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	2FI131221	Algebraic Structures	4	2+1+1	120
2.	2FI131121	Operational Research	4	2+1+1	120

Courses, 3 year - 5 semester

No.	Code	Courses	ECTS	Hours	Total
1.	2FI103321	Computer Architecture	8	3+2+2	240
2.	2FI103421	Internet Programming	8	3+2+2	240
3.	2FI103521	Computer Graphics and Visualization	6	2+2+1	180
4.		Elected subject from list No.6	4	2+1+1	120
5.		Elected subject from list No.6	4	2+1+1	120
		Total ECTS	**30**	**12+8+7**	**900**

List No. 6 of elective subjects (choose two of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	2FI131721	Advanced Algorithms	4	2+1+1	120
2.	2FI132121	Multimedia	4	2+1+1	120

No.	Code	Courses	ECTS	Hours	Total
3.	2FI132221	System Software	4	2+1+1	120
4.	2FI131821	Parallel Programming	4	2+1+1	120

Courses, 3 year - 6 semester

No.	Code	Courses	ECTS	Hours	Total
1.	2FI104321	Information Systems	6	2+2+1	180
2.	2FI104221	Numerical Methods	6	2+2+1	180
3.	2FI104121	Information Theory	6	2+2+1	180
4.	2FI104421	Distributed Computer Systems	6	2+2+1	180
5.		Elected subject from list No.7	4	2+1+1	180
		Total ECTS	**30**	**10+9+7**	**900**

List No. 7 of elective subjects (choose one of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	2FI133221	Network and Concurrent Programming	4	2+1+1	120
2.	2FI133321	Software Project Management	4	2+1+1	120
3.	2FI133421	Introduction to Statistical Analysis	4	2+1+1	120

Courses, 4 year - 7 semester

No.	Code	Courses	ECTS	Hours	Total
1.	2FI104821	Computer System Security	8	3+2+2	240
2.	2FI104921	Artificial Intelligence	8	3+2+2	240
3.	2FI105121	Basics of Robotics	6	2+2+1	180
4.		Elected subject from list No.8	4	2+1+1	120
5.		Elected subject from list No.8	4	2+1+1	120
		Total ECTS	**30**	**12+8+7**	**900**

List No. 8 of elective subjects (choose two of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	2FI133921	JavaScript-based Technologies	4	2+1+1	120
2.	2FI134321	Information Systems Development	4	2+1+1	120
3.	2FI134421	Applied Software Engineering in a Real Environment	4	2+1+1	120
4.	2FI136521	Web Services and XML	4	2+1+1	120

Courses, 4 year - 8 semester

No.	Code	Courses	ECTS	Hours	Total
1.	2FI105821	Bioinformatics	4	2+1+1	120
2.	2FI105921	Modeling and Simulations	4	2+1+1	120
3.	2FI106021	Human-Computer Interaction	4	2+1+1	120
4.		Elected subject from list No.9	4	2+1+1	120
5.		Elected subject from list No.9	4	2+1+1	120
6.		Practical work – interdisciplinary project	4	0+0+4	120
7.		Graduate Thesis	6	0+0+8	180
		Total ECTS	**30**	**10+5+17**	**900**

List No. 9 of elective subjects (choose two of the offered subjects)

No.	Code	Courses	ECTS	Hours	Total
1.	2FI135621	Machine Learning	4	2+1+1	120
2.	2FI135721	Internet of Things	4	2+1+1	120
3.	2FI135321	Mobile Application Development	4	2+1+1	120
4.	2FI135821	Integral Transforms and Applications	4	2+1+1	120
5.	2FI134521	Cloud Technologies	4	2+1+1	120

Legend: In the field weekly fund of hours, the expression (a + b + c) denotes: a-lectures; b-auditory exercises; c) laboratory exercises