Caucasus University

Undergraduate Program in Computer Science

Caucasus University

Caucasus School of Technology

Program Name	
Computer Science	
Program Name in Georgian	
კომპიუტერული მეცნიერება	
Degree level	
Bachelor's	
Type of the educational program	
Academic	
Language of Instruction	
Georgian	
Expected Qualification and Code	
In Georgian:	კომპიუტერული მეცნიერების ბაკალავრი 0613
In English:	Bachelor of Computer Science 0613
Academic head of the Program	
Affiliated Porfessor Maksim Iavich, PhD.	
Program Volume in Credit Hours	

The Bachelor's Degree Program in Computer Science comprises 240 credits. 1 ECTS equals to 25 hours, which includes class hours and time spent on independent work (midterm and final examinations, as well as homework assignments).
Consequently, the standard official duration of the Bachelor's Degree Program is four years, but maximum six years. After expiration of the standard duration of the Bachelor's Degree Academic Program, the students having academic debts, with the view of completing the program, are allowed to continue education through additional semesters by retaining the student's status.

The program is envisages a narrow sphere and free components learning courses:
Learning courses of narrow sphere (192 ECTS credits):

- Mandatory learning courses -126 ECTS
- Optional learning courses - 66 ECTS

Learning courses of free component (48 ECTS credits):

- Mandatory learning courses of university - 15 ECTS
- Optional learning courses of university - 15 ECTS
- Free credits - 18 ECTS

Program Description

Admission Requirements

- Any person having a secondary education is entitled to enroll in the Undergraduate Program in Computer Science.
- The precondition for admission to the program is to pass the Unified National Examination. Any exceptions to the Law on Enrolment at Higher Education Institutions are allowed only in the cases prescribed by Law.
- Mobility to the program is allowed in accordance with the procedures set by the relevant law.

Program Objectives

The objectives of the Program in Computer Science are to:

1. To prepare highly qualified Computer Science specialists who possess deep theoretical knowledge and practical skills, capable of developing, implementing, and managing software solutions in a modern digital environment.
2. To develop analytical and innovative thinking skills in graduates, enabling them to create new technological solutions and address complex challenges.
3. To foster professionals with high ethical standards, capable of effective communication in multidisciplinary environments, possessing teamwork skills, and ready for continuous professional development amidst technological changes.
4. To enhance graduates' competitiveness in the labor market, ensuring their readiness for both employment and further academic education in various fields of Computer Science.

Learning Outcomes

Upon completion of the Bachelor's degree program in Computer Science, the graduate will acquire the following competencies:

1. Describes the operating principles of software and hardware, analyzes the fundamental theoretical foundations of computer science, and the importance of modern information technologies in implementing projects across various fields.
2. Solves complex algorithmic problems, and develops and evolves software, using diverse programming paradigms and technologies to achieve efficiency.
3. Analyzes and integrates user requirements into the design, development, and implementation of computer science-based solutions, ensuring their usability and functionality.
4. In alignment with disciplinary contexts, participates in the development, implementation, and evaluation of computer technology-based solutions, according to specified computer science requirements.
5. Works effectively in teams, conducts professional communication with various stakeholders, and applies teamwork principles and the ability to share responsibility.
6. Applies programming, computer system operation principles, the latest approaches, and technological tools in practice.
7. Plans professional development, assesses personal learning needs, seeks ways to improve knowledge and skills, acquires new technologies and methodologies, and uses effective communication skills when drafting and presenting professional texts.
8. Demonstrates and shares ethical principles, social responsibility, and professional values related to computer science, applying these principles in professional activities and decision-making

Building a Career

Internships and Job Placements

The program structure allows students to be "job ready" early in the program and offers opportunities for career advancement. Students will be offered to be part of the coordinated internship programs or get a job placement through the support of the CU Career Center.

Career Opportunities

Program graduates will have an opportunity to work in a variety of environments such as industry, media, government, private and business organizations. As a rule, the work of graduates involves the following types of activities: analyzing problems for solutions, formulating and testing, using advanced communications or

multimedia equipment, or working in teams for product development. Examples of job titles of program graduates may include: Software Developer, Computer Communications Specialist, System and Security Administrator, Network Systems and Data Communications Analyst, IT Business Management Consultant, Product Line Manager, Telecommunications Manager, Multimedia Developer, Animator etc.

Study Continuation Opportunities

The program graduates can continue their studies at any of Master's Degree programs in Georgia or abroad, in accordance with the regulation required by the law.

Program Curriculum

№	Code	Prerequisite	Course	Year								ECTS
				I		II		III		IV		
				Semester								
				I	II	III	IV	V	VI	VII	VIII	
Learning courses of narrow sphere												
Mandatory learning courses -126 ECTS												
1.	MATH 0003		Calculus I	x								5
2.	MATH 0002		Linear Algebra	x								5
3.	PROG 1142		Principles of Computer Programming I	x								7
4.	MATH 0004	MATH 0003	Calculus II		x							5
5.	MATH 1240		Discrete Mathematics		x							5
6.	CTC 1242		Computer Architecture		x							5
7.	PROG 1242	PROG 1142	Principles of Computer Programming II		x							8
8.	PHYS 2140	MATH 0004	Principles of Physics			x						5
9.	PRP 2144	PROG 1242	Programming Paradigms			x						5
10.	PYPR 2141	PROG 1142	Python Programming			x						5
11.	PST 2141	MATH 0003	Probability & Statistics			x						5
12.	ALGO 2141	PROG 1242	Introduction to Algorithms & Data Structures			x						5
13.	WPRG 2241	PROG 1142	Web Technologies I				x					5
14.	OSSC 2241	CTC 1242	Operating Systems & Computer Security				x					5
15.	OOPP 2241	PYPR 2141	Object Oriented Programming Usung Python				x					5
16.	CTC 2144		Principles of Networking				x					5
17.	CTC 2243	PROG 1142	Introduction to Database Systems				x					5
18.	SCPM 3142	MATH 0004	Scientific Computing					x				6
19.	CTC 4147	ALGO 2141	Artificial Intelligence					x				6
20.	CTC 4141	PROG 1142	Software Engineering I						x			6
21.	CTC 3244	PROG 1142	.NET Technologies I						x			6
22.	BPRO 4241		Bachelor's Project								x	12
Optional learning courses - 66 ECTS												

№	Code	Prerequisite	Course	Year								ECTS
				I		II		III		IV		
				Semester								
				I	II	III	IV	V	VI	VII	VIII	
23.	ELC 2240	PHYS 2140	Electronics				x					5
24.	WPRG 3141	WPRG 2241	Web Technologies II					x				6
25.	CTC 3249	ALGO 2141	Algorithms & Data Structures II					x				6
26.	CTC 3145	OSSC 2241	System Administration I					x				6
27.	CTC 3148	CTC 2144	Virtualization Technology					x				6
28.	SEC 3140		Usable Security					x				6
29.	SEC 3141		Ethical Hacking					x				6
30.	SEC 3142		Web Penetration Testing					x				6
31.	NW 3141	CTC 2144	Management of Computer Networks I					x				6
32.	DMK 3140		Digital Marketing					x				6
33.	DSY 3140	ALGO 2141 CTC 2241	Distributed Systems					x				6
34.	HPC 3140	CTC 2144	Introduction to High-Performance Computing (HPC) System					x				6
35.	CTC 4145	CTC 2243	Database Administration					x				6
36.	NW 3241	NW 3141	Management of Computer Networks II						x			6
37.	CTC 3241	PROG 1142	User Interfaces						x			6
38.	CTC 3242	PROG 1142	Software Security						x			6
39.	CTC 3243	PROG 1142	Java Programming Language I						x			6
40.	SEC 3241	SEC 3142	Web Penetration Testing II						x			6
41.	OSS 3240	CTC 3145	Server-side Operating Systems Security						x			6
42.	CTC 3245	CTC 2143	System Administration II						x			6
43.	CTC 3246		Network Security						x			6
44.	CTC 3247	CTC 2144	Corporate Wireless Networks						x			6
45.	DA 3240		Digital Art						x			6
46.	PRW 3240		Specialization Project						x			6
47	TELC 3240	ELC 2240	Communication Theory						x			6
48	PHY 3240	PHY 3140	Python Programming Language II						x			6
49	FPR 3240	PRP 2144	Functional Programming						x			6

№	Code	Prerequisite	Course	Year								ECTS
				I		II		III		IV		
				Semester								
				I	II	III	IV	V	VI	VII	VIII	
50.	CPL 3240	PROG 1142	Compilers						x			6
51.	HDW 3240		Hardware Product Prototyping						x			6
52.	CTC 3248	NW 3141	Wide Area Networking							x		6
53.	CTC 4142	CTC 3243	Java Programming Language II							x		6
54.	CTC 4143	CTC 3244	.NET Technologies II							x		6
55.	NWS 4141	CTC 2144	Security Systems of Corporate Networks							x		6
56.	NWS 4142	CTC 3247	Wireless Networks and Security							x		6
57.	CTC 4144	CTC 3145	System Administration III							x		6
58.	CTC 4146	CTC 2144	Network & Service Management							x		6
59.	CTC 4148	SCPM 3141	Cryptography							x		6
60.	ITPM 4140		IT Project Management							x		6
61.	ALGO 4140	ALGO 2141	Problem-solving Using Algorithms and Data Structures							x		6
62.	ITL 4140		Legal Issues of Information Technology							x		6
63.	TELC 3245	TELC 3240	Digital Communication							x		6
64.	ELC 4142	TELC 3240	Wireless Communication Systems							x		6
65.	CTC 4241	CTC 4141	Software Engineering II							x		6
66.	CTC 4242		Voice Over IP								x	6
67.	CTC 4243	CTC 1243	Mobile Programming								x	6
68.	CTC 4244	CTC 3248	Wide Area Networking II								x	6
69.	CTC 4248		Block-chain Technology & Cryptocurrency								x	6
70.	BI 4241	CTC 2243	Busines Inteligen									
71.	AICS 4241		AI and Cybersecurity									
72.	PAR 4240	PROG 1142	Principles of Parallel Programming								x	6
73.	CTC 4249	ALGO 2141; PST 2141	Machine Learning								x	6
74.	TEST 4240	PROG 1142	Principles of Test Automation Engineering								x	6
Learning courses of free component												
Mandatory learning courses of university - 15 ECTS												

№	Code	Prerequisite	Course	Year								ECTS
				I		II		III		IV		
				Semester								
				I	II	III	IV	V	VI	VII	VIII	
75.	ACWR 0007		Academic Writing	x								5
76.	ENGL 0007	ENGL 0006	General English B2.0	x								5
77.	ENGL 0008	ENGL 0007	General English B2		x							5
Optional learning courses of university - 15 ECTS												
78.	CIS 1140		Computer Skills and Office Applications	x								5
79.	CIS 1242	CIS 1140	Data Processing and Visualization		x							5
80.	MATL 2240		Software Tools for Modeling I		x							5
81.	ENGL 0009	ENGL 0008	General English C1.0			x						5
82.	ENGL 0010	ENGL 0009	General English C1				x					5
83.	ENGL 0005		General English B1.0 [i]	x								5
84.	ENGL 0006	ENGL 0005	General English B1		x							5
85.	MATH 0001		Pre Calculus [ii]	x								5
86.	HIST 0001		Introduction to World History & Civilization	x								5
87.	POLS 0002		Political Science									5
88.	HIST 0003		History of Georgia									5
89.	SOCI 0004		Sociology									5
90.	PHIL 0005		Philosophy									5
91.	PSYC 0006		Psychology									
92.	ENTP 0009		Entrepreneurship									5
Free credits - 18 ECTS												
93.			Free Course [iii]						x			
			ECTS Per Year	60		60		60		60		
			Courses Per Year	12		12		10		9		

[i] General English Language B1 Level is mandatory for those students who have competency lower, than the Level B2.
[ii] "PreCalculus" is mandatory for those students who have low competency in Math.
[iii] Student can take courses in terms of "Free Course" from the other Bachelor's degree programs and/or form the Elective Specialization Courses in this program.