CAUCASUS UNIVERSITY

კავკასიის ტექნოლოგიების სკოლა
CAUCASUS SCHOOL OF TECHNOLOGY

Undergraduate Program in

Computer Science

Program Name	
	კომპიუტერული მეცნიერების საბაკალავრო პროგრამა

Program Name in English	
	Bachelor's Program in Computer Science

Degree level	
	Bachelor's

Type of the educational program	
	Academic

Instruction Language	
	Georgian

Expected Qualification and Code		
In Georgian:	კომპიუტერული მეცნიერების ბაკალავრი	0613
In English:	Bachelor of Computer Science	0613

Date of Program Approval	
	10 May 2007

Academic head of the Program	
	Maksim Iavich PhD. Porfessor at Caucasus University

Program Volume in Credit Hours	

The program consists of 240 ECTS credits. Caucasus University uses European Credit Transfer and Accumulation System (ECTS) to describe volume of expected work from the students. A credit is a unit for volume of work that is required from the students in terms of time spent. 1 ECTS credit is worth of 25 hours of student's academic workload.

The Bachelor's program is envisaged as narrow sphere and free components learning courses:

Learning courses of narrow sphere (182 ECTS credits):
- Mandatory learning courses -152 ECTS credits;
- Optional learning courses - 30 ECTS
Learning courses of free component (58 ECTS credits):
- Mandatory learning courses of university - 20 ECTS credits;
- Optional learning couses of university - 20 ECTS credits;
- Free credits - 18 ECTS credits.

Some of the Courses are taught in English.

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 procedures set by the relevant law.

Program Objectives

The objectives of the Program in Computer Science are to:
- Provide the student with an in-depth knowledge of the theoretical aspects of higher education disciplines, which prepares the person for further study at the Master's degree program or work with a qualification.
- Give student an interdisciplinary education in Computer Science, based on fundamental theories and principles of mathematics and Computer Science, which will enable him / her to develop professionally and contribute to the development of the field.
- Prepare high-level, competitive specialists with the broad theoretical knowledge and practice-oriented, transferable skills necessary for professional development in modern IT field in Georgia and abroad as well.

Learning Outcomes

Upon completion of the Bachelor's degree program in Computer Science, the graduate will acquire the following competencies:
- Describes the basic concepts of computer science. Based on the knowledge of the principles of mathematical and computer technology, explains the theoretical and practical aspects of the field, the main features of the field and modern trends.
- Analyzes complex computational problems and selects the appropriate algorithm for their solution.
- Develops and implements complex software systems.
- Participates effectively in teamwork in program-related activities.
- Applies the principles of programming, computer systems, the latest approaches and technological tools in practice
- Realizes the importance of evaluating the learning process, the need to constantly update professional knowledge and acquire new knowledge, conducts oral and written communication.
- Appreciates and shares technology-related values, ethical and social responsibilities with others.

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.

Student Evaluation and Grading System

The aim of the evaluation is to assess to what extent the learning outcomes prescribed by the syllabus are reached. The student's evaluation consists of multiple components and evaluates the course goals and learning outcomes by applying measurable criteria and appropriate rubrics. The student's evaluation is based on four major principles: objectivity, trustworthiness, validity and transparency.

The students are evaluated according to two sets of evaluation: summative and formative. The aim of the summative assessment is to accurately evaluate the student's performance. It monitors quality of learning and the level of the student's achievement in relation to the goals set by the course. The formative assessment is oriented on the student's development. It gives students appropriate feedback on their achievements.

The evaluation system includes 100 points and envisages:
a) Five types of positive grades:
a.a) (A) Excellent – 91-100 points of assessment;
a.b) (B) Very good – 81-90 points of maximal assessment;
a.c) (C) Good – 71-80 points of maximal assessment;
a.d) (D) Satisfactory – 61-70 points of maximal assessment;
a.e) (E) Sufficient – 51-60 points of maximal assessment;
b) two negative grades:
b.a) (FX) Did not pass – 41-50 points of maximal assessment, which means the student needs to work harder and is allowed to retake the exam one more time after working independently;

b.b) (F) Fail – 40 points or less of maximal assessment, which means the student's work is insufficient and he/she has to retake the course.

Students are awarded credits on the basis of the final evaluation comprising the scores of the interim and final exam assessments. The attainment of student's learning outcomes considers the interim and final evaluations, for which relative proportions out of the total score (100 points) and a minimum competence level are allocated. Namely, out of 100 points, the interim results are allocated 70 points, while the final exam results are 30 points. In both of the components (interim and final) the minimum competency barrier to be reached is 51%. The interim evaluation includes assessment components, the total of which is 70 points. For each assessment component, the evaluation is based on the pre-determined learning goals, task-oriented clear criteria and the learning rubrics drawn on their basis. In the interim results Freshmen student (except B2 level English groups) has to accumulate at least 51% of the 70 points to be allowed to take the final exam. The student's final examination is passed, if he/she gets at least 51% of the total 30 points,

For All the rest the student has to accumulate at least 59% of the 70 points to be allowed to take the final exam. The student's final examination is passed, if he/she gets at least 60% of the total 30 points.

In case the student fails to overcome the minimum competency barrier of the final exam, he/she is allowed to retake the final examination. The student shall retake the final examination within the period prescribed by the academic calendar no later than 5 days after announcement of the results of the final exam.

In case the student totally scores 0-50 points or fails to overcome the minimum competency barrier set for any form of the evaluation (Interim/Final exam), he/she shall be given a grade of "F-0".

Teaching and Learning Methods

Different teaching methods are employed during the teaching process depending on the topics covered. Those include:

Discussions/debates – one of the most common methods of interactive teaching. Quality of Students' involvement is higher; classes are more dynamic and students are more active. Any discussion can turn into a debate. The method allows professors to give questions and get answers and enables students to develop skills of discussion and debates and prepares them for justifying their opinions and points.

Team (Collaborative) work - the method implies dividing students into teams and assigning different tasks to them. Each team member works on the task individually and shares his/her ideas with the rest. Depending on the type of task, team members can change tasks and roles. The strategy ensures students' maximum involvement in the learning process.

Problem Based Learning (PBL) – a problem is given and analyzed in order to acquire knowledge.

Cooperative Learning – where the whole class is responsible not only for his/her own learning and understanding of the subject matter but also for aiding and assisting others in better understanding it. Each student works on a problem until he/she fully understands everything.

Heuristic method – is largely incremental. Students are to discover facts on their own and make links between them.

Case Studies – Professors and students discuss a particular case and fully comprehend an issue at hand. In Medicine it can be discussion of the medical record of a particular patient, in Political Science it can be analysis of a conflict between any two countries (e.g., Armenia-Azerbaijan), etc.

Brain storming – the method facilitates to generating as many ideas about a particular topic as possible. The method encourages creativity; it is particularly efficient with a large group of students and consists of a few stages:
- Creative approach to a problem/issue
- Listing the ideas generated, without any criticism, on the board.
- Identifying the ideas most closely linked with the problem/issue;
- Identifying criteria for finding which idea is more relevant to the issue/problem at hand;
- Evaluating selected ideas according to pre-selected criteria;
- Selecting the best idea – the one having the best evaluation or meeting most of the criteria;

Role play – students are assigned different roles, which allows them to look at a problem from different perspectives. Like debates, role play also helps students develop skills needed for giving their opinion and justifying their judgments.

Method of Demonstration – displaying visual materials. In majority of cases it is better to give students both audio and visual material simultaneously; the material can be given by both - professors and students; the method implies giving visual information on the whiteboard or carrying out a complex laboratory experiment.

Induction, Deduction, Analysis, Synthesis.

A deductive approach means that the teacher gives students a new concept, explains it and then has the students practice using the concept.

In contrast with the deductive method, inductive instruction makes use of student "noticing". Instead of explaining a given concept and following this explanation with examples, the teacher presents students with many examples showing how the concept is used. The intent is for students to "notice", by way of the examples, how the concept works and fits together.

With the method of analysis a problem is disintegrated into components. This method facilitates to comprehensive analysis of each of the constituent elements of a more complex problem.

Method of synthesis is opposite of the process of analysis. One whole is made by grouping its constituent elements, which allows students to look at a problem as one whole.

Explanatory method – discussing a particular issue, i.e., professor provides examples and discusses all sides and details.

Action-oriented teaching – requires active participation of both professor and students where major emphasis is put on practical interpretation of theoretical knowledge.

E-learning - The method combines three ways of instruction

Teaching methods complement each other during the teaching process. Course syllabus provides detailed information about teaching methods used.

Human Resourses

The Program is implemented by the Academic and Invited Personnel: Thirteen Professors, Five Associate Professors, one Assistant-Professor, Three Assistants and Thirty-two Invited Lecturers, who, according to their quialification are ready to help students in developing the competencies, difined by the program.

Partnership

Caucasus University's and Caucasus School of Technology's Partner organizations: foreign and Georgian higher educational institutions, as well as governmental and non-governmental organizations are also involved into the program implementation, within the framework of a Memorandum of Cooperation.

Partner Governmental and non-governmental organizations:
- HR Recruitment Agency;
- Aliance Group Holding;
- Omedia;
- GITA;
- EY;
- Imobiliare;
- Silknet;
- UGT;
- Orient Logic;
- MyGPS;
- ZETEN;
- Scientific Research Institute Optica;
- Guramex;
- Georgian National Communications Commission;
- Ministry of Defence of Georgia;
- Ministry of Justice of Georgia;
- Ministry of Finance of Goergia;
- National Bank of Georgia;
- Tbilisi City Hall.

Foreign higher educational institutions:
- Tallinn University of Technology;
- Riga Technical University;
- Upper Austria University of Applied Sciences (Hagenberg);
- FH JOANNEUM University of Applied Sciences;
- University of Southern Denmark;
- Kaunas University Of Technology;
- University of Lodz;
- University of Alcala;
- Fairleigh Dickinson University;
- New Jersey City University;
- Ming Chuan University of Taiwan;
- Universidad Autonoma de Gvadalajara, Mexico;
- IESB, Brasilia Higher Education Institute, Brazil.

Material and Technical Resourses

For reaching the outcomes envisaged by the Program, the University infrastructure and material and technical resources urestrictedly accessible for the students and the academic personnel, namely: Auditoria equiped with approapriate equipment and conference hall; Computer classes/labs, computers connected to the internet and intranet and specially tailored software guaranteeing smooth operation of learning/teaching process;

The material resources of the Universty ensure the goals set by the Program are reached and the planned, outcomes are realized:

Premises: the Program is conducted on the University premises where sanitary-hygiene and safety rules are adhered to. The University building fully complies with technical requirements establied for Universities; the University has audtoria designed for lectures and practical classes fully equipped with apropriate equipment and devices (projectors, desks and chairs, whiteboards, etc.).

Library: The University library has printed and electronic fund relevant to the implementation of the Bachelor's Program. Library resource fund is accessible for the students and academic and invited personnel (20 605 printed and 10877 electronic units). The library has an electronic catalogue. The library has a Reading Room equipped with appropriate property (chairs, desks, computers). The library has one photocopier which can be used by students with the help of two library staff members. The Reading Room allows students to use internet and international electronic resources:

- ✓ EBSCO HOST
- ✓ ScienceDirect
- ✓ Scopus
- ✓ Sci-val Funding(Funding Institutional)
- ✓ HeinOnline
- ✓ Taylor and Francis
- ✓ Math Scientific Publishing (MSP)-Journals

Information-Communication Technologies – laboratories with computer equipment appropriate for the Bachelor's Program and corresponding to modern IT requirements are available at the Universityy: computers are connected to the internet and can be accessed by students, academic, invited and administrative personnel. The computers are equipped with appropriate instruments/applications. The auditoria and computer classes are equipped with local net and internet.

The University operates an electronic system for organizing the educational process, which fosters academic processes and makes monitoring of the students' academic performance possible at all times. The University makes the catalogue of the educational programs and the information on implementation of the educational programs and conducting the educational process public and accessible at all times.

Currently, Caucasus University is equipped with modern computers and photocopying machines (they were replaced with the most up-to-date ones in 2018). The University has seven computer classes on A, B and C floors. Such classes are equipped with PC and Multimedia Projectors. Projectors and Computers are available in each auditorium. The University administration and practically all the employees have access to the computers and internet. The University operates a Computer Park with more than 380 units. In addition, the University has printers and scanners; a few so-called Smart Boards, photocopying machines "Kyocera" brand, color photocopying machines "HP MFD" type. Wi-Fi and IP telephone connection are accessible throughout the whole University premises. There are three modern servers in the University Server Department where appropriate net equipment is installed (with Cisco and Aruba/HP switches, Fortinet, NG Firewall, wireless controller and access point, etc.) more than 100 such devices. The University is connected to the external net and has 150/150 Mbps access to local and global connections.

The mentioned resources are freely accessible for the University students, academic, invited and administrative personnel. All the interested persons are informed on the possibility of using these resources and are familiar with the rules and procedures of their utilization.

Financial Resourses

The Budget of the program envisages revenues received from students and all the expenses required for full functioning. Financial calculations are base on following data:

- ● Contact hours required for teaching
- ● Number of course (mandatory, elective and foreign language)
- ● Payment of lecture hours
- ● Material support of students during process
- ● Expenditure of university administration
- ● Expenditure of Development/Accreditaion/ Internationalization of the program
- ● The unforeseen expenditure during the program.

In the budget of the program is set "University Reserve Fund", which is to ensure to cover all expenses for the fully functioning of the program, when number of students are at minimum. In case of amendment to the program, the program budget is adjusted according to the amendment.

The budget of the program is approved by the president of Caucasus University, which is confirmed by order, attached with calculations of the program budget.

№	Course Code	Prerequisite	Course	I Semester	II Semester	III Semester	IV Semester	V Semester	VI Semester	VII Semester	VIII Semester	ECTS
					Year							
					I		II		III		IV	
					ECTS							
			Required General Educational Courses									
1.	CIS 1140		Computer Skills and Office Applications	x								5
2.	ACWR 0007		Academic Writing	x								5
3.	ENGL 0007	ENGL 0006	B2.0 General English Language	x								5
4.	ENGL 0008	ENGL 0007	B2 General English Language		x							5
			Elective General Education Courses									
5.	ENGL 0005		B1.0 General English Language [1]	x								5
6.	ENGL 0006	ENGL 0005	B1 General English Language [1]		x							5
7.	ENGL 0009	ENGL 0008	C1.0 General English Language			x						5
8.	ENGL 0010	ENGL 0009	C1 General English Language				x					5
9.	MATH 0001		PreCalculus [2]	x								5
10.	CIS 1241	CIS 1140	Data Analisis		x							5
11.	HIST 0001		Introduction to World History & Civilization									5
12.	POLS 0002		Political Science									5
13.	HIST 0003		History of Georgia									5
14.	SOCI 0004		Sociology			x						5
15.	PHIL 0005		Philosophy									5
16.	PSYC 0006		Psychology									
17.	ENTP 0009		Entrepreneurship									5
			Required Specialization Courses									
18.	MATH 0003		Calculus I	x								5
19.	MATH 0004	MATH 0003	Calculus II		x							5
20.	MATH 1240		Discrete Mathematics		x							5
21.	MATH 2240	MATH 0004	Scinetific Computing			x						5

№	Course Code	Prerequisite	Course	Year								ECTS
				I		II		III		IV		
				ECTS								
				I Semester	II Semester	III Semester	IV Semester	V Semester	VI Semester	VII Semester	VIII Semester	
22.	PHYS 2140	MATH 0003	Principles of Physics			x						5
23.	CTC 1141		Principles of Computer Programming I	x								5
24.	CTC 1242		Computer Architecture		x							5
25.	CTC 1243	CTC 1141	Principles of Computer Programming II		x							5
26.	CTC 2141	CTC 1141	Web Technologies I				x					5
27.	CTC 2143	CTC 1242	Operating Systems				x					5
28.	CTC 2145	CTC 1243	Object Oriented Programming				x					5
29.	CTC 2144		Principles of Networking					x				5
30.	CTC 2241	CTC 2141	Web Technologies II					x				5
31.	CTC 2243		Introduction to Database Systems					x				5
32.	CTC 2244		Computer Security					x				5
33.	CTC 2245	CTC 1243	Algorithms & Data Structures I [3]					x				5
34.	CTC 3249	CTC 2245	Algorithms & Data Structures II						x			6
35.	CTC 3149	CTC 1243	Programming Paradigms						x			6
36.	CTC 4247	CTC 1243	Python Programming Language [ENG]						x			6
37.	PST 3240	MATH 0004	Probability & Statistics [4]						x			6
38.	CTC 3244	CTC 1243	.NET Technologies I							x		6
39.	CTC 4141	CTC 1243	Software Engineering I							x		6
40.	CPL 3240	CTC 1243	Compilers							x		6
41.	CTC 4147	CTC 2245	Artificial Inteligence								x	6
42.	CTC 4241		Software Engineering II								x	6
Elective Specialization Courses												
43.	ELC 2240	PHYS 2140	Electronics				x					5
44.	MATL 1240		Data Modelling I		x							5
45.	CTC 3143	CTC 2241	Web Technologies III					x				6
46.	CTC 3145		System Administration I					x				6
47.	CTC 3148	CTC 2144	Virtualization Technology					x				6

№	Course Code	Prerequisite	Course	Year								ECTS
				I		II		III		IV		
				ECTS								
				I Semester	II Semester	III Semester	IV Semester	V Semester	VI Semester	VII Semester	VIII Semester	ECTS
48.	SEC 3140		Usable Security					x				6
49.	SEC 3141		Etical Hacking					x				6
50.	SEC 3142		Web penetration testing					x				6
51.	CTC 4145	CTC 2243	Database Administration					x				6
52.	NW 3141	CTC 2144	Management of Computer Networks I					x				6
53.	MK 3140		Digital Marketing					x				6
54.	DSY 3140	CTC 2245	Distributed Systems					x				6
55.	NW 3241	NW 3141	Management of Computer Networks II						x			6
56.	CTC 3241	CTC 1243	User Interfaces						x			6
57.	CTC 3242		Software Security [ENG]						x			6
58.	CTC 3243	CTC 1243	Java Programming Language I						x			6
59.	WEB 3240	CTC 3143	Web Technologies IV						x			6
60.	CTC 3245		System Administration II						x			6
61.	CTC 3246		Network Security						x			6
62.	CTC 3247	CTC 2144	Corporate Wireless Networks						x			6
63.	DA 3240		Digital Art						x			6
64.	PRW 3240		Specialization Project						x			6
65.	TELC 3240		Theory of Telecommunications						x			6
66.	PHY 3240	CTC 4247	Python Programming Language II						x			6
67.	FPR 3240	CTC 2245	Functional Programming						x			6
68.	CTC 3248	CTC 2144	Wide Area Networking							x		6
69.	CTC 4142	CTC 3243	Java Programming Language II							x		6
70.	CTC 4143	CTC 3244	.NET Technologies II							x		6
71.	CTC 4144	CTC 3145	System Administration III							x		6
72.	CTC 4146	CTC 2144	Network & Service Management							x		6
73.	CTC 4148	MATH 2140	Cryptography [ENG]							x		6
74.	ITPM 4140		IT Project Management [5]							x		6

№	Course Code	Prerequisite	Course	I Semester	II Semester	III Semester	IV Semester	V Semester	VI Semester	VII Semester	VIII Semester	ECTS
75.	ALGO 4140	CTC 2245	Problem-solving using algorithms and data structures							x		6
76.	ITL 4140		Legal Issues of Information Technology							x		6
77.	TELC 3245	TELC 3240	Digital Telecommunication							x		6
78.	ELC 4142		Wireless communication systems							x		6
79.	CTC 4242		Voice Over IP								x	6
80.	CTC 4243	CTC 1243	Mobile Programming								x	6
81.	CTC 4244	CTC 3248	Wide Area Networking II								x	6
82.	CTC 4248		Blockchain Technology & Cryptocurrency								x	6
83.	PAR 4240		Principles Of Parallel Programming								x	6
84.	CTC 4249	PST 3240	Machine Learning								x	6
85.	TEST 4240	CTC 2241	Principles of Test Automation Engineering								x	6
86.			Free Course [6]							x		6
Bachelol's Thesis												
87.	BPR 4240		Bachelol's Thesis [7]								x	12

ECTS				I Semester	II Semester	III Semester	IV Semester	V Semester	VI Semester	VII Semester	VIII Semester
Per Semester				30	30	30	30	30	30	30	30
Per Year				60		60		60		60	
Courses Per Year				12		12		10		8	

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[1] General English Language B1 Level is mandatory for those students who have competency lower, than the Level B2.

[2] "PreCalculus" is mandatory for those students who have low competency in Math.

[3] Student, who already has accumulated 120 ECTS credits after the first two academic years, instead of the course - Algorithms & Data Structures I, will take the course - CTC 3141 Algorithms & Data Structures (In accordance to the previous program).

[4] "Probability & Statistics" is elective before Intake 2017-2018.

[5] "IT Project Management" is elective before Intake 2016-2017.

[6] Student can take courses in terms of "Free Course" (18 ECTS) from the other Bachelor's degree programs and/or form the Elective Specialization Courses in this program.

[7] "Bachelol's Thesis" is elective before Intake 2014-2015.

[ENG] The course is taught in English.

Distribution of Total Hours

№	Course Name	ECTS Credits\ Hours	Lecture / Practical Work Hours	Seminar Hours	Midterm and Final Exam Hours	Presentation Hours	Out of class preparation Hours
1.	Computer Skills and Office Applications	5/125	19	5	4	2	95
2.	Data Analisis	5/125	20	4	4	2	95
3.	Academic Writing	5/125	21	3	4	2	95
4.	B1.0 General English Language	5/125	53	9	4	2	57
5.	B1 General English Language	5/125	53	9	4	2	57
6.	B2.0 General English Language	5/125	58	3	4	3	57
7.	B2 General English Language	5/125	58	3	5	3	57
8.	C1.0 General English Language	5/125	58	3	4	3	57
9.	C1 General English Language	5/125	58	3	4	3	57
10.	Pre Calculus	5/125	18	6	4	2	95
11.	Introduction to World History & Civilization	5/125	14	10	4	2	95
12.	Political Science	5/125	17	7	4	2	95
13.	History of Georgia	5/125	19	5	4	2	95
14.	Sociology	5/125	20	4	4	2	95
15.	Philosophy	5/125	17	7	4	2	95
16.	Psychology	5/125	18	4	4	4	95
17.	Entrepreneurship	5/125	26		4		95
18.	Calculus I	5/125	18	6	4	2	95
19.	Calculus II	5/125	18	6	4	2	95
20.	Discrete Mathematics	5/125	22	4	4		95
21.	Scinetific Computing	5/125	18	6	4	2	95
22.	Principles of Physics	5/125	21	5	4		95
23.	Electronics	5/125	21	3	4	2	95
24.	Principles of Computer Programming I	5/125	28	4	4		89
25.	Computer Architecture	5/125	20	4	4	2	95
26.	Principles of Computer Programming II	5/125	28	4	4		89
27.	Web Technologies I	5/125	19	5	4	2	95
28.	Operating Systems	5/125	19	5	4	2	95
29.	Principles of Networking	5/125	19	5	4	2	95
30.	Web Technologies II	5/125	27	3	4	2	89
31.	Introduction to Database Systems	5/125	21	3	4	2	95
32.	Computer Security	5/125	22	4	4		95
33.	Object Oriented Programming	5/125	19	5	4	2	95
34.	Algorithms & Data Structures I	5/125	28	4	4		89

№	Course Name	ECTS Credits\Hours	Lecture / Practical Work Hours	Seminar Hours	Midterm and Final Exam Hours	Presentation Hours	Out of class preparation Hours
35.	Data Modelling I	5/125	22	4	4		95
36.	Specialization Project	6/150	20				130
37.	IT Project Management	6/150	19	3	4	4	120
38.	Digital Art	6/150	17	5	4	4	120
39.	Web Technologies III	6/150	18	6	4	2	120
40.	Database Administration	6/150	21	5	4		120
41.	System Administration I	6/150	21	5	4		120
42.	Management of Computer Networks I	6/150	20	4	4	2	120
43.	Management of Computer Networks II	6/150	20	4	4	2	120
44.	Digital Marketing	6/150	19	5	4	2	120
45.	Programming Paradigms	6/150	23	3	4		120
46.	Probability & Statistics	6/150	21	3	4	2	120
47.	User Interfaces	6/150	22	4	4		120
48.	Distributed Systems	6/150	24		4	2	120
49.	Software Security	6/150	21	5	4		120
50.	Java Programming Language I	6/150	20	4	4	2	120
51.	Artificial Inteligence	6/150	22	4	4		120
52.	Blockchain Technology & Cryptocurrency	6/150	22	4	4		120
53.	System Administration II	6/150	20	4	4	2	120
54.	Network Security	6/150	19	5	4	2	120
55.	Corporate Wireless Networks	6/150	20	4	4	2	120
56.	Wide Area Networking	6/150	19	5	4	2	120
57.	Algorithms & Data Structures II	6/150	28	4	4		114
58.	Problem-solving using algorithms and data structures	6/150	26		4		120
59.	Software Engineering I	6/150	21	5	4		120
60.	Java Programming Language II	6/150	19	5	4	2	120
61.	Theory of Telecommunications	6/150	22	4	4		120
62.	.NET Technologies I	6/150	24	2	4		120
63.	Python Programming Language	6/150	23	3	4		120
64.	Python Programming Language II	6/150	23	3	4		120
65.	Functional Programming	6/150	23	3	4		120
66.	Web Technologies IV	6/150	24		4	2	120
67.	Virtualization Technology	6/150	21	5	4		120
68.	Wide Area Networking II	6/150	20	4	4	2	120
69.	System Administration III	6/150	23	3	4		120
70.	Usable Security	6/150	21	5	4		120
71.	Web penetration testing	6/150	22	4	4		120
72.	Etical Hacking	6/150	21	5	4		120

№	Course Name	ECTS Credits\Hours	Lecture / Practical Work Hours	Seminar Hours	Midterm and Final Exam Hours	Presentation Hours	Out of class preparation Hours
73.	Cryptography	6/150	21	5	4		120
74.	Machine Learning	6/150	21	5	4		120
75.	Digital Telecommunication	6/150	22	4	4		120
76.	Wireless communication systems	6/150	22	4	4		120
77.	Software Engineering II	6/150	21	5	4		120
78.	Network & Service Management	6/150	20	6	4		120
79.	.NET Technologies II	6/150	24	2	4		120
80.	Voice Over IP	6/150	20	6	4		120
81.	Mobile Programming	6/150	21	5	4		120
82.	Legal Issues of Information Technology	6/150	21	5	4		120
83.	Principles Of Parallel Programming	6/150	22	4	4		120
84.	Principles of Test Automation Engineering	6/150	21	5	4		120
85.	Bachelol's Thesis	12/300	14				286

Map of Learning Outcomes

№	Semester	Course code	Course Name	Describes the basic concepts of computer science. Based on the knowledge of the principles of mathematical and computer technology, explains the theoretical and practical aspects of the field, the main features of the field and modern trends.	Analyzes complex computational problems and selects the appropriate algorithm for their solution.	Develops and implements complex software systems	Participates effectively in teamwork in program-related activities.	Applies the principles of programming, computer systems, the latest approaches and technological tools in practice	Realizes the importance of evaluating the learning process, the need to constantly update professional knowledge and acquire new knowledge, conducts oral and written communication.	Appreciates and shares technology-related values, ethical and social responsibilities with others.
1.	I	CIS 1140	Computer Skills and Office Applications					High [1]	Medium [2]	
2.	I	WRT 1140	Academic Writing						High	Medium
3.	I	ENGL 0007	B2.0 General English Language						High	High
4.	I	MATH 0003	Calculus I	High	Medium					Low [3]
5.	I	CTC 1141	Principles of Computer Programming I	High	High	High				
6.	II	ENGL 0008	B2 General English Language						High	High
7.	II	MATH 0004	Calculus II	High	Medium					Low
8.	II	CTC 1242	Computer Architecture	Medium						
9.	II	CTC 1243	Principles of Computer Programming II	High	High	High				
10.	II	MATH 1240	Discrete Mathematics		High	Medium				
11.	III	MATH 2140	Scinetific Computing	High	Medium	Medium				
12.	III	PHYS 2140	Principles of Physics	Medium		Medium				
13.	III	CTC 2141	Web Technologies I	High			High	High		
14.	III	CTC 2143	Operating Systems	High				Medium		
15.	III	CTC 2145	Object Oriented Programming	High	High	High				
16.	IV	CTC 2144	Principles of Networking	Medium						
17.	IV	CTC 2241	Web Technologies II			High	High	High		
18.	IV	CTC 2243	Introduction to Database Systems	Medium		High	High			

№	Semester	Course code	Course Name	Describes the basic concepts of computer science. Based on the knowledge of the principles of mathematical and computer technology, explains the theoretical and practical aspects of the field, the main features of the field and modern trends.	Analyzes complex computational problems and selects the appropriate algorithm for their solution.	Develops and implements complex software systems	Participates effectively in teamwork in program-related activities.	Applies the principles of programming, computer systems, the latest approaches and technological tools in practice	Realizes the importance of evaluating the learning process, the need to constantly update professional knowledge and acquire new knowledge, conducts oral and written communication.	Appreciates and shares technology-related values, ethical and social responsibilities with others.
19.	IV	CTC 2244	Computer Security	Medium			High	High		Medium
20.	IV	CTC 2245	Algorithms & Data Structures I	Medium	High	High				
21.	V	CTC 3249	Algorithms & Data Structures II	Medium	High	High				
22.	V	PST 3240	Probability & Statistics	High						Low
23.	V	CTC 3149	Programming Paradigms	High	High	High				
24.	V	CTC 4247	Python Programming Language	Medium	High	High	High			
25.	VI	CTC 4141	Software Engineering I	Medium		High	High	High		
26.	VI	CTC 3244	.NET Technologies I	Medium	High	High		High		
27.	VII	CTC 4241	Software Engineering II			High	High	High		
28.	VII	CTC 4147	Artificial Inteligence	High	High					
29.	VIII	BPR 4242	Bachelol's Thesis	Medium	High	High	High	High	Medium	Medium

[1] The correlation between the learning outcomes of the course and the program is High.

[2] The correlation between the learning outcomes of the course and the program is Medium.

[3] The correlation between the learning outcomes of the course and the program is Low.

Map of Program Objectives and Learning Outcomes

Program Objectives / Learning Outcomes	To provide the student with an in-depth knowledge of the theoretical aspects of higher education disciplines, which prepares the person for further study at the Master's degree program or work with a qualification.	To give student an interdisciplinary education in Computer Science, based on fundamental theories and principles of mathematics and Computer Science, which will enable him / her to develop professionally and contribute to the development of the field	To prepare high-level, competitive specialists with the broad theoretical knowledge and practice-oriented, transferable skills necessary for professional development in modern IT field in Georgia and abroad as well
Describes the basic concepts of computer science. Based on the knowledge of the principles of mathematical and computer technology, explains the theoretical and practical aspects of the field, the main features of the field and modern trends.	X	X	
Analyzes complex computational problems and selects the appropriate algorithm for their solution.		X	X
Develops and implements complex software systems.		X	X
Participates effectively in teamwork in program-related activities.		X	X
Applies the principles of programming, computer systems, the latest approaches and technological tools in practice		X	X
Realizes the importance of evaluating the learning process, the need to constantly update professional knowledge and acquire new knowledge, conducts oral and written communication.	X	X	
Appreciates and shares technology-related values, ethical and social responsibilities with others.	X	X	

Academic and Invited Personnel

#	Personnel Name	Status	Course
1.	Abesalom Iashvili	Invited Lecturer	Electronics
2.	Avtandil Kavrelishvili	Professor	Database Administration
			.NET Technologies I
			.NET Technologies II
3.	Akaki Khvedelidze	Invited Lecturer	System Administration I
4.	Alina Tkabladze	Invited Lecturer	Principles of Test Automation Engineering
5.	Aleskandre Lomadze	Invited Lecturer	Artificial Inteligence
6.	Archil Shengelia	Invited Lecturer	Virtualization Technology
			Voice Over IP
			Network & Service Management
7.	Bekar Oikashvili	Assistant-Professor	System Administration II
8.	Gela Butbaia	Invited Lecturer	Blockchain Technology & Cryptocurrency
9.	Giorgi Alkhazishvili	Invited Lecturer	Software Engineering I
			Software Engineering II
10.	Giorgi Datukishvili	Professor	Data Analisis
11.	Giorgi Iashvili	Invited Lecturer	Usable Security
			Etical Hacking
			Web penetration testing
12.	Giorgi Iashvili	Invited Lecturer	Computer Security
13.	Giorgi Karanadze	Invited Lecturer	Digital Marketing
14.	Giorgi Lobjanidze	Professor	Pre Calculus
15.	Giorgi Nikuradze	Invited Lecturer	Digital Art
16.	Giorgi Pirveli	Invited Lecturer	Legal Issues of Information Technology
17.	Giorgi Cubinidze	Invited Lecturer	IT Project Management
18.	Daviti Magaldadze	Invited Lecturer	Web Technologies I
			Web Technologies III
			Web Technologies IV
19.	Guranda Chelidze	Professor	Political Science
20.	Nugzar Gognadze	Invited Lecturer	Machine Learning
21.	Ekaterine Kvachantiradze	Professor	Introduction to World History & Civilization
22.	Vano Otkhozoria	Associate Professor	Management of Computer Networks I
			Management of Computer Networks II
			Wide Area Networking
			Wide Area Networking II
			Computer Architecture
			Principles of Networking
23.	Vano Chiaureli	Invited Lecturer	Philosophy
24.	Zaza Gamezardashvili	Associate Professor	Algorithms & Data Structures I
			Algorithms & Data Structures II
			Principles of Computer Programming I
			Principles of Computer Programming II
25.	Zurab Bragvadze	Professor	History of Georgia
26.	Zura Sekhniashvili	Invited Lecturer	Web Technologies II

#	Personnel Name	Status	Course
27.	Tamar Sharashenidze-Soyucok	Invited Lecturer	B2.0 General English Language
			B2 General English Language
28.	Tamta Mshvidobadze	Invited Lecturer	C1.0 General English Language
			C1 General English Language
29.	Teimuraz Khutsishvili	Professor	Calculus II
30.	Temur Jangveladze	Invited Lecturer	Scinetific Computing
31.	Luka Gorgadze	Invited Lecturer	Distributed Systems
			Problem-solving using algorithms and data structures
32.	Mariam Sordia	Invited Lecturer	Data Modelling
33.	Mariam Kobuladze	Invited Lecturer	User Interfaces
34.	Maksim Iavich	Professor	Python Programming Language
			Python Programming Language II
			Software Security
			Cryptography
			Principles Of Parallel Programming
35.	Medea Gelenava	Associate Professor	Introduction to Database Systems
36.	Merab Tavartkiladze	Professor	System Administration III
37.	Mzia Tediashvili	Professor	Psychology
38.	Natia Suarishvili	Invited Lecturer	Probability & Statistics
39.	Nikoloz Akhvlediani	Invited Lecturer	Mobile Programming
40.	Nino Beradze	Invited Lecturer	Academic Writing
41.	Nodar Kankava	Invited Lecturer	Programming Paradigms
			Functional Programming
42.	Nodar Ughrelidze	Professor	Theory of Telecommunications
			Digital Telecommunication
			Wireless communication systems
43.	Nugzar Botchoidze	Invited Lecturer	Principles of Physics
44.	Nugzar Skhirtladze	Professor	Calculus I
45.	Otar Magaldadze	Invited Lecturer	Object Oriented Programming
46.	Rusudan Chachanidze	Invited Lecturer	Entrepreneurship
47.	Salome Gogberashvili	Invited Lecturer	B1.0 General English Language
			B1 General English Language
48.	Soso Tsotniashvili	Invited Lecturer	Discrete Mathematics
49.	Sofia Katamadze	Invited Lecturer	Java Programming Language I
			Java Programming Language II
50.	Ketevan Datukishvili	Professor	Computer Skills and Office Applications
51.	Ketevan Mukhiguli	Associate Professor	Sociology
52.	Shalva Kvirkvelia	Invited Lecturer	Corporate Wireless Networks
53.	Shalva Svanishvili	Invited Lecturer	Operating Systems
			Network Security