Bachelor's Educational Program

Title of the Program

კომპიუტერული ინფორმაციული ტექნოლოგიები
Computer information technologies

Faculty

ინფორმატიკისა და მართვის სისტემების
Faculty of Informatics and Control Systems

Program Supervisor/ Supervisors

Professor Zurab Bosikashvili
Professor Mzia Kiknadze

Qualification to be Awarded, and the Number of Credits in the Program

Bachelor of Information Technology

Awarded in case of gaining of no less than 240 credits

Teaching Language

Georgian

Admission Prerequisites to the Program

Prerequisites for admission to the Bachelor's Educational Program

- Passing of the united national examinations, in accordance with the rules established by Georgian legislation: mathematics or physics, Georgian language; foreign language (English).
- Enrollment may be provided through internal and external mobility, in accordance with the regulations established by the Ministry of Education and Science of Georgia and Georgian Technical University.
- Admission to the program, without passing the united national examinations is possible in accordance with the rules established by the Ministry of Education and Science or Georgia.

Program Description

Technological progress has caused creation of the new research spheres, resulting in need of training of the highly qualified specialists in the relevant areas. All over the world, information technologies are regarded as one of the most demanding industries and therefore, today, many leading universities prepare the specialists in

this area.

Bachelor's educational program is based on the teaching methodologies in IT sphere, recognized all over the world:

- The Association for Computer Machinery (ACM, http://www.acm.org);
- The Computer Society (IEEE-CS, http://computer.org)
- https://www.abet.org/
- The industrial indicators of higher education in ICT sphere are taken into consideration

https://eqe.ge/res/NewFolder/NewFolder/NewFolder/NewFolder/NewFolder/ICTs%20%E1%83%9D%E1%83%A5%E1%83%9B%E1%83%98%208.pdf

As well as labor market requirements.

The goals of learning program correspond to the mission of Georgian Technical University, they are clearly formulated, realistic, achievable and reflect the knowledge and skills to elaboration of which in the graduates is the learning program oriented.

Educational program is composed based on the European Credit Transfer System (ECTS), program provides 240 credits. At Georgian Technical University, 1 credit is equal to 25 hours, including both, contact and independent work hours. Credits distribution by learning courses is provided in the education plan.

The learning program duration is 4 years, 8 semesters.

Academic year includes two, fall and spring semesters. The education agenda, dates of midterm, final/additional exams shall be specified in the beginning of each semester, by the rector's order, on the basis of Instruction for Education Process Management at Georgian Technical University at:

https://gtu.ge/Study-Dep/Files/Pdf/sasw_proc_%20mart_inst_20.08.2021_SD.pdf

Education program includes the following components:

Main learning courses in the specialty;

Optional courses in the specialty;

General learning courses;

Industrial practice and bachelor's work/project

Semester I	• Main learning courses in the specialty – 25 ECTS; • General learning courses – 5 ECTS;
Semester II	• Main learning courses in the specialty – 24 ECTS; • General learning courses – 5 ECTS;
Semester III	• Main learning courses in the specialty – 15 ECTS; • Optional learning courses in the specialty – 10 ECTS; • General learning courses – 5 ECTS;
Semester IV	• Main learning courses in the specialty – 15 ECTS; • Optional learning courses in the specialty – 10 ECTS; • General learning courses – 5 ECTS;
Semester V	• Main learning courses in the specialty – 20 ECTS; • Optional learning courses in the specialty – 5 ECTS; • General learning courses – 5 ECTS;
Semester VI	• Main learning courses in the specialty – 25 ECTS; • Optional learning courses in the specialty – 5 ECTS;
Semester VII	• Mandatory learning courses in the specialty – 15 ECTS; • Mandatory industrial practice in the specialty – 5 ECTS; • Optional learning courses in the specialty – 5 ECTS; • Free component – 5 ECTS;
Semester VIII	• Mandatory learning courses in the specialty – 10 ECTS; • Optional learning courses in the specialty – 5 ECTS; • Mandatory bachelor's project in the specialty – 10 ECTS; • Free component – 5 ECTS;
Industrial practice is provided to the students in semester VII, it includes 5 credits and 90 hours. The students complete the bachelor's work in the eighth semester.	

Program Objective

Objective of the bachelor's learning program:

- Train the specialists with systemic, fundamental, theoretical and practial knowledge copetitive at local and international labor markets for practical and research activities, in key IT areas: programming, databases, web technologies and computer networks, with due regard of key theoretical and technological principles of human-computer interaction;
- Provide to the graduates knowledge of practical and research issues in information technologies;
- Elaborate in the graduates the skills of analysis and research of the objects in IT sphere;

Learning Outcomes/Competences (general and professional)

Learning outcomes correspond to the objectives and content of the learning program, they are measurable and achievable; they correspond to the relevant level of qualification and academic degree to be awarded. Upon completion of the program, the graduate:

1. Has wide knowledge in information technologies, covering the issues related to the key IT areas;
2. Provides identification and formulation of the problems to be solved, applying the standard and state-of-art methods, based on the systemic knowledge, in key IT areas;
3. Based on acquire knowledge, analysis of the users' requirements in databases, computer networks and web technologies;
4. Solves, according to the predetermined instructions, the specific problems, using the instruments of key IT spheres;
5. Participates in design, development and management of the secure program systems, databases, websites and computer networks;
6. Participates, constructively, in the teamwork and formulates proper conclusions, provides presentation of knowledge to the academic and professional community, with due regard of ethical issues;
7. Provides planning of his/her development, using information technologies and in the theoretical sphere.

Methods of Achieving Learning Outcomes (Teaching – Learning)

☒ Lecture ☒ Seminar (working in groups) ☒ Practical class ☒ Laboratory ☒ Practice ☒ Course work / project ☒ Consultation ☒ Independent work

Based on the specifics of a learning course, the appropriate activities listed below are employed, reflected in the relevant learning courses (syllabi): lecture, independent work, practical work, seminar, practice (industrial), project development and presentation, bachelor's work.
Based on specifics of a learning course program, in the process of learning, the following activities of learning and teaching methods are applied, as reflected in the relevant syllabi of the learning courses:

- Discussions / debates;
- თანამშრომლობითი (cooperative) სწავლება;
- პრობლემაზე დაფუძნებული სწავლება (PBL);
- Case study
- Brain storming
- Working in groups (collaborative);
- Demonstration method;
- ინდუქციური;
- დედუქციური;
- Analysis;
- Synthesis;
- Brainstorming;
- Verbal;
- Explanative method;
- Written work method;
- Project development and presentation.

Relevant activities of learning and teaching methods are provided on the website of Georgian Technical University: https://gtu.ge/pdf/forms-instructions/educational-process.pdf

Student Knowledge Assessment System

Grading system is based on a 100-point

scale.Positive grades:
- (A) - Excellent - grades between 91-100 points;
- (B) – Very good - grades between 81-90 points
- (C) - Good - grades between 71-80 points
- (D) - Satisfactory - grades between 61-70 points
- (E) - Pass - the rating of 51-60 points

Negative grades:
- (FX) - Did not pass - grades between 41-50 points, which means that the student is required towork more to pass and is given the right, after independent work, to take one extra exam;
- (F) – Failed - 40 points and less, which means that the work carried out by the student did not bring any results and he/she has to learn the subject from the beginning.

The student disputing the evaluation of the learning outcomes shall be entitled to submit, within five working days from the date of familiarization with the assessment results, grounded grievance to the Dean and request revision of the outcomes at: https://gtu.ge/pdf/forms-instructions/appeal-restore.pdf

Detailed information about evaluation system is provided in the instruction of educational process at Georgian technical University at: https://gtu.ge/pdf/forms-instructions/educational-process.pdf .

Assessment of the practice is provided in accordance with the Rules of Conducting and Evaluation of GTU students practice, at: https://gtu.ge/pdf/forms-instructions/conducting-evaluating.pdf .

Evaluation of the bachelor's work defense is provided in accordance with the rules of performance of the bachelor's research project / work at: https://gtu.ge/pdf/forms-instructions/bachelor-research-project.pdf

Sphere of Employment

With the knowledge and skills acquired within the learning program, the graduate can be employed by the public and private companies of relevant profile, providing use and development of the program systems, web services based on IT technologies, data processing and management, designing and administration of the computer networks.

Potential for Further Education

Master's educational program

Human and Material Resources Required to Implement the Program

Suitable human and material resources are provided for the program. Additional information is provided in annexed documentation.

Number of Attached Syllabuses: 73
Courses in the Program

No:	Learning Course	Course Prerequisites	ECTS Credits							
			Year I		Year II		Year III		Year IV	
			Semester							
			I	II	III	IV	V	VI	VII	VIII

№	Course	Prerequisite								
1	Engineering mathematics 1	No	5							
2	General physics A	No	4							
3	Introduction to information technologies	No	4							
4	Computer architecture and organization (CIT)	No	5							
5	Basics of programming (based on C/C++) (CIT)	No	5							
6	Elements of academic writing	No	3							
7	English language 1	No	5							
8	Engineering mathematics 2	Engineering mathematics 1		5						
9	General physics B	Physics 1		4						
10	Data structuring and algorithms (CIT)	Basics of programming (based on C/C++) (CIT)		5						
11	Fundamentals of operating systems (CIT)	Computer architecture and organization (CIT)		5						
12	Web programming (HTML5,CSS3, Javascript)	No		5						
13	English language 2	English language 1		5						
14	English language 3	English language 2			5					
15	Designing and managing databases (based on SQL Server)	Basics of programming (based on C/C++) (CIT)			5					
16	Foundations of Artificial Intelligence (CIT)	Basics of programming (based on C/C++) (CIT)			5					
	Optional in specialty 1									
17.1	Object-oriented programming (Java) (CIT)	Data structures and algorithms (CIT)			5					
17.2	Object-oriented programming C# (CIT)	Data structures and algorithms (CIT)								
18	Programming Based On The Multipurpose Python Language	Data structures and algorithms (CIT)			5					
19	Web design (UI & UX)	Introduction to information technologies			5					
20	Databases administration (MS SQL)	Designing and managing databases (based on SQL Server)				5				
	Optional in specialty 2									
21.1	Web Development (PHP Based)	Web programming (HTML5,CSS3, Javascript)				5				
21.2	Web Technologies (Python DJango FrameWork)	Web programming (HTML5,CSS3, Javascript); Programming Based On The Multipurpose Python Language				5				
21.3	Web-application programming in .NET	Web design (UI & UX); Object-oriented programming C#								
	Optional in specialty 3									
22.1	Information Systems Programming (Based on Java)	Object-oriented programming on Java(CIT);				5				

No.	Subject	Prerequisite								
		Designing and managing databases (based on SQL Server)								
22.2	Information systems programming (C#)	Object-oriented programming C# (CIT); Designing and managing databases (based on SQL Server)								
22.3	Programming of Artificial Intelligence Tasks with Python (CIT)	Programming Based On The Multipurpose Python Language								
23	Computer Networks Fundamentals (CIT)	Fundamentals of operating systems (CIT)			5					
24	**General optional**									
24.1	Principles of economics	No								
24.2	Applied psychology	No								
24.3	History and culture of Georgia	No			5					
24,4	Sociology	No								
24.5	Introduction to philosophy	No								
25	English language 4	English language 3			5					
26	**Optional in specialty 4**									
26.1	Programming using the Laravel Framework	Web Development (PHP Based)				5				
26.2	Creation and management of web pages (WordPress)	Web programming (HTML5,CSS3, Javascript)								
27	IT Systems Analyze and Design	Information Systems Programming (Based on Java) / Information systems programming (C#); Computer Networks Fundamentals (CIT)				5 5				
28	Computer Networks Administration (CIT)	Computer Networks Fundamentals (CIT)				5				
29	Non-relational database	Databases administration (MS SQL)				5				
30	Introduction to Discrete Mathematics	Engineering mathematics 2				5				
31	Software Engineering Fundamentals	Data structures and algorithms(CIT)					5			
32	**Optional in the specialty 5**									
32.1	Mobile applications for Android	Object Oriented Programming (Java) (CIT)					5			
32.2	Mobile Application Development for iOS	Information systems programming (C#)								

№		Prerequisites								
33	Big data storage and processing systems	Designing and managing databases (based on SQL Server)						5		
34	Internet of things (CIT)	Computer Networks Fundamentals (CIT)						5		
35	Introduction to Information Security (CIT)	Fundamentals of operating systems (CIT)						5		
36	Human-computer interactions (CIT)	Information Systems Programming (Based on Java) / Information systems programming (C#)						5		
37	Internship Practice (CIT)	Learning courses of semesters V and VI, no less than 25 ICTS credits							5	
38	Analytical Services in Databases (CIT)	Designing and managing databases (based on SQL Server)							5	
39	Project's Computer Management	No							5	
40	Cyber Security Challenges	Computer Networks Fundamentals (CIT); Introduction to Information Security (CIT)							5	
41	**Optional in the specialty 6**									
41.1	Blockchain and its applications (CIT)	Computer Networks Fundamentals (CIT)							5	
41.2	Clouds and Grid Technologies (CIT)	Computer Networks Fundamentals (CIT)								
42	Bachelor project (CIT)	Learning courses of the previous semester, Internship Practice (CIT)								10
43	Administration of the information systems - devops	Computer Networks Administration (CIT))								5
44	IT Service Management	No								5
45	**Optional in specialty 7**									
45.1	Coding and encryption in cryptosystems	Introduction to Information Security (CIT)								5
45.2	Communication Subnetworks Design	Computer Networks Administration (CIT)								
45.3	Game's Artificial Intelligence	No								
45.4	Database management system Oracle	Designing and managing databases (based on SQL Server)								
1	**Free component 1**	No					5			
2	**Free component 2**	No							5	
	Free component 3	No								5
			31	29	30	30	30	30	30	30

			60	**60**	**60**	**60**
			240			

Free components

№	Learning courses	Prerequisite	ECTS Credit
1.	Business communication	No	**5**
2.	European civilization	No	**5**
3.	E-Government	No	**5**
4.	Cultures and Organizations of the Modern World	No	**5**
5.	Computed bookkeeping	No	**5**
6.	Principles of marketing	No	**5**
7.	Hospitality ethics and art of negotiation	No	**5**
8.	Workd civilizations	No	**5**
9.	Organization IT Project Management	No	**5**
10.	Religion and political processes in the Europe	No	**5**
11.	History of religions	No	**5**
12.	Business Correspondence	No	**5**
13.	Creative thinking basics	No	**5**
14.	Digital econommics	No	**5**
15.	Artificial Intelligence for Robotics	No	**5**
16.	Artificial neuron network – what is this?	No	**5**

Program curriculum

No:	Course Identification Code	Learning Course	ECTS Credit/Hours	Lecture	Seminar (work in the group)	Practical classes	Laboratory	Practice	Course work/project	Mid-semester exam	Final exam	Independent work
						Hours						
1	**MAS33508G1-LP**	Engineering mathematics 1	**5/125**	15		30				1	2	77
2	**PHS51208G1-LB**	General physics A	**5/125**	15			15			1	2	67
3	**ICT14508G4-LP**	Introduction to information technologies	**4/100**	5		25				1	2	68
4	**ICT26408G2-LP**	Computer architecture and organization (CIT)	**5/125**	15		30				1	2	77
5	**ICT31908G4-LB**	Basics of programming (based on C/C++) (CIT)	**5/125**	15			30			2	3	75
6	**LEH18712G3-LS**	Academic Writing Elements	**3/75**	15	15					1	1	43
7	**LEH15012G3-P**	English language 1	**5/125**			45				1	1	78
8	**MAS33608G1-LP**	Engineering mathematics 2	**5/125**	15		30				1	2	77
9	**PHS51308G1-LB**	General physics B	**4/100**	15			15			1	2	67
10	**ICT31308G4-LP**	Data structuring and algorithms (CIT)	**5/125**	15		30				1	2	77
11	**ICT14608G4-LP**	Fundamentals of operating systems (CIT)	**5/125**	15		30				1	2	77
12	**ICT37408G2-LB**	Web programming (HTML5,CSS3, Javascript)	**5/125**	15			30			1	2	77
13	**LEH15112G3-P**	English language 2	**5/125**			45				1	1	78
14	**LEH15212G3-P**	English language 3	**5/125**			45				1	1	78
15	**ICT32008G4-LPK**	Designing and managing databases (based on SQL Server)	**5/125**	15		20			10	1	2	77
16	**ICT32108G4-LP**	Foundations of Artificial Intelligence	**5/125**	15		30				1	2	77

No.	Code	Name	5/125								
		(CIT)									
17.1	**ICT31408G4-LP**	Object-oriented programming (Java) (CIT)	**5/125**	**15**		**30**			**1**	**2**	**77**
17.2	**ICT32208G4-LP**	Object-oriented programming C# (CIT)	**5/125**	**15**		**30**			**2**	**3**	**75**
18	**ICT32308G4-LP**	Programming Based On The Multipurpose Python Language	**5/125**	**15**		**30**			**1**	**2**	**77**
19	**ICT14908G4-LP**	Web design (UI & UX)	**5/125**	**2**		**43**			**1**	**2**	**77**
20	**ICT32408G4-LBK**	Administration of databases (MS SQL)	**5/125**	**15**			**15**	**15**	**1**	**2**	**77**
21.1	**ICT15008G4-LP**	Web Development (PHP Based)	**5/125**	**15**		**30**			**1**	**2**	**77**
21.2	**ICT15108G4-LB**	Web technologies (DJango FrameWork)	**5/125**	**15**			**30**		**1**	**2**	**77**
21.3	**ICT15208G4-LP**	Web-application programming in .NET	**5/125**	**15**		**30**			**1**	**3**	**76**
22.1	**ICT15308G4-LPK**	Information Systems Programming (Based on Java)	**5/125**	**10**		**25**		**10**	**1**	**2**	**77**
22.2	**ICT32508G4-LPK**	Information systems programming (C#)	**5/125**	**10**		**25**		**10**	**1**	**2**	**77**
22.3	**ICT14708G4-LP**	Programming of Artificial Intelligence Tasks with Python (CIT)	**5/125**	**15**		**30**			**1**	**2**	**77**
23	**ICT26708G2-LP**	Computer Networks Fundamentals (CIT)	**5/125**	**15**		**30**			**1**	**2**	**77**
24.1	**SOS10912G1-LS**	Principles of economics	**5/125**	**15**	**30**				**2**	**2**	**76**
24.2	**SOS32512G1-LS**	Applied psychology	**5/125**	**15**	**30**				**1**	**1**	**78**
24.3	**HEL20312G1-LS**	History and culture of Georgia	**5/125**	**15**	**30**				**1**	**1**	**78**
24.4	**SOS40212G1-LS**	Social sciences	**5/125**	**15**	**30**				**1**	**1**	**78**
24.5	**HEL30512G1-LS**	Introduction to philosophy	**5/125**	**15**	**30**				**2**	**2**	**76**
25	**LEH15312G3-P**	English language 4	**5/125**			**45**			**1**	**1**	**78**
26.1	**ICT15408G4-LP**	Programming using the Laravel Framework	**5/125**	**15**		**30**			**1**	**2**	**77**

No.	Code	Name									Total
26.2	**ICT14808G4-LP**	Creation and management of web pages (WordPress) (CIT)	**5/125**	**15**	**30**				**1**	**2**	**77**
27	**ICT15508G4-LP**	IT Systems analysis and design	**5/125**	**15**	**30**				**1**	**2**	**77**
28	**ICT26508G2-LPK**	Administration of computer networks (CIT)	**5/125**	**15**	**20**			**10**	**1**	**2**	**77**
29	**ICT31508G4-LPK**	Non-relative databases	**5/125**	**15**	**15**			**15**	**1**	**2**	**77**
30	**MAS31808G1-LP**	Elements of discrete mathematics	**5/125**	**15**	**30**				**1**	**2**	**77**
31	**ICT31608G4-LBK**	Software Engineering Fundamentals	**5/125**	**15**		**15**		**15**	**1**	**2**	**77**
32.1	**ICT32708G4-LP**	Mobile applications Development for android	**5/125**	**15**	**30**				**1**	**2**	**77**
32.2	**ICT32608G4-LP**	Mobile Application Development for iOS	**5/125**	**15**	**30**				**1**	**2**	**77**
33	**ICT32808G4-LP**	Big data storage and processing systems	**5/125**	**15**	**30**				**1**	**2**	**77**
34	**ICT26808G2-LPK**	Internet of things (CIT)	**5/125**	**10**	**25**			**10**	**1**	**2**	**77**
35	**ICT32908G4-LP**	Introduction to Information Security (CIT)	**5/125**	**15**	**30**				**1**	**2**	**77**
36	**ICT15708G4-LP**	Human-Computer Interaction (CIT)	**5/125**	**15**	**30**				**1**	**2**	**77**
37	**ICT57108G1-R**	Internship Practice (CIT)	**5/125**				**90**			**2**	**33**
38	**ICT33008G4-LB**	Analytical Services in Databases (CIT)	**5/125**	**15**		**30**			**1**	**2**	**77**
39	**ICT59008G1-PBK**	Project's Computer Management	**5/125**			**15**	**15**	**15**	**1**	**2**	**77**
40	**ICT31708G4-LP**	Cyber Security Challenges	**5/125**	**15**	**30**				**1**	**2**	**77**
41.1	**ICT26908G2-LP**	Blockchain and its applications (CIT)	**5/125**	**15**	**30**				**1**	**2**	**77**
41.2	**ICT27008G2-LP**	Clouds and Grid Technologies (CIT)	**5/125**	**15**	**30**				**1**	**2**	**77**
42	**ICT33108G4-K**	Bachelor project (CIT)	**10/250**					**60**	**2**	**2**	**186**
43	**ICT26608G2-LP**	Administration of the information systems - devops	**5/125**	**15**	**30**				**1**	**2**	**77**

44	**ICT33208G4-LS**	IT Service Management	**5/125**								
45.1	**ICT15608G4-LP**	Encryption and encryption in cryptosystems	**5/125**	**15**		**30**			**1**	**2**	**77**
45.2	**ICT23408G1-LBK**	Communication Subnetworks Design	**5/125**	**14**			**20**	**11**	**1**	**2**	**77**
45.3	**ICT12708G2-LP**	Game's Artificial Intelligence	**5/125**	**15**		**30**			**1**	**2**	**77**
45.4	**ICT31808G4-LS**	Databases management system Oracle	**5/125**	**13**	**24**				**1**	**2**	**85**

Free component

No:	Course Identification Code	Learning Course	ECTS Credit/Hours	Lecture	Seminar (work in the group)	Practical classes	Laboratory	Practice	Course work/project	Mid-semester exam	Final exam	Independent work
						Hours						
1.	**ICT58308G1-P**	Business communication	**5/125**			45				1	2	77
2.	**SOS24112G1-LS**	European civilization	**5/125**	15	30					2	2	76
3.	**BUA80813G1-LP**	E- government	**5/125**	15	30					2	2	76
4.	**SOS25312G1-LS**	Cultures and organizations of contemporary world	**5/125**	15	30					2	2	76
5.	**ICT58908G1-LB**	Computed bookkeeping	**5/125**	15			30			1	1	77
6.	**SOS22312G1-LS**	Principles of marketing	**5/125**	15	30					1	1	78
7.	**PES11513G1-LS**	Hospitality ethics and art of negotiation	**5/125**	15	25				5	1	1	78
8.	**EL22012G1-LS**	Worked civilizations	**5/125**	15	30					2	2	76
9.	**ICT48508G1-LP**	Principles of management of organizational IT projects	**5/125**	15		30				1	1	77
10.	**SOS24112G1-LS**	Religion and political processes in the Europe	**5/125**	15	30					2	2	76
11.	**HEL10112G1-LS**	History of religions	**5/125**	15	30					1	1	78
12.	**BUA36013G3-LS**	Entrepreneurial thinking	**5/125**	15	17	8			5	1	1	78
13.	**ICT58408G1-LP**	Business correspondence	**5/125**	15	30					1	2	77
14.	**ICT12408G2-LS**	Principles of creative thinking	**5/125**	15	30					1	2	77
15.	**SOS14612G2-LS**	Digital economics	**5/125**	15	30					2	2	76
16.	**ICT12608G2-LS**	Artificial intelligence in the robots	**5/125**	15	30					1	2	77
17.	**ICT18108G2-LP**	Artificial neuron network – what is this?	**5/125**	15	30					1	2	77

Program Supervisor/Supervisors   Zurab Bosikashvili

Mzia Kiknadze

Faculty of informatics and Conrol Systems
Head of Quality Assurance Service
of the Faculty   Tinatin Kaishauri

Dean of the Faculty   Tamar Lominadze

Agreed with
Quality Assurance Service of GTU   David Makhviladze

Approved by Informatics and Conrol Systems
 At the Session of the Faculty Council
            27.11.2023

Chairman of the Faculty Council   Tamar Lominadze