



### Bachelor's Educational Program

#### Title of the Program

სამოქალაქო ინჟინერია

Civil Engineering

#### Faculty

სამშენებლო

Civil Engineering

#### Program Supervisor/ Supervisors

Professor Alexander Bagration-Davitashvili

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

##### Bachelor of Science in Civil Engineering

Bachelor's qualification will be awarded with a combination of not less than 235 credits of courses relevant to field of study and at least 5 credits of free components.

#### Teaching Language

English

#### Admission Prerequisites to the Program

Only the holder of a state certificate of complete general education or a person equal to him, who is enrolled in accordance with the rules established by the legislation of Georgia, has the right to study for a bachelor's degree.

- Citizens of Georgia will be enrolled based on the results of the United National Exams.
- International applicants will be enrolled in accordance with statement № 224 / N issued by the Ministry of Education, Science, Culture and Sports of Georgia on December 29, 2011.

It is obligatory to present a certificate / document proving English language proficiency at B2 level. To prove English language proficiency, the applicant must submit one of the following:

- a) Official international certificate: TOEFL, IELTS, Cambridge ESOL (English for Speakers of Other Languages), TELC (The European Language Certificates), Michigan (Cambridge Michigan);
- b) Proof of English language proficiency from high school, college or university, proving that the applicant was taught in English;
- c) Certificate issued by a local or international English language teaching provider confirming that B2 level of English has been achieved by the applicant through the relevant course.
- d) An applicant who fails to submit the above mentioned documents is required to pass a B2-level proficiency test in English at the GTU Computer Center.

Note: English language requirements can be waived if English is the native language of the applicant or if he / she has graduated from high school / university in a country where English is the official language and the applicant has studied English accordingly.

## Program Description

### **Program content with credits:**

A student must earn at least 240 credits to award an academic degree in Civil Engineering under the **Bachelor of Science in Civil Engineering**'s English-language education program, which will ensure that the program's objectives and relevant learning outcomes meet the eligibility requirements of the higher education qualifier.

The program is compiled according to the European Credit Transfer System (ECTS), 1 credit equals 25 hours and includes contact and independent working hours. The distribution of credits is presented in the curriculum.

### **Duration of study:**

The duration of the program is defined as not less than 4 years (8 semesters), The semester includes 20 weeks. GTU has 15 weeks of study (auditory courses) and 5 sessions (midterm, final and additional exams) during one semester.

### **Educational program structure:**

The curriculum includes compulsory components of relevant content for the main field of study - a total of 200 credits (including undergraduate internship - 4 credits and a bachelor's project with a total of 7 credits), compulsory elective components of relevant content for the main field of study - a total of 35 credits and free credits .

### **Instructions for choosing an optional component:**

The process of selecting both free components and elective courses related to the profession should be transparent; In order to define his / her profile, the student should be provided with the necessary information, advice and assistance. To do this, the Dean of the Faculty has a person of appropriate qualifications and experience who will provide qualified assistance to students in their elective components. If necessary, the head of the relevant department is involved in the consultation process. Prior to the start of the semester, each student of the program will be sent a personal page on the GTU e-learning portal, as well as a text message to the contact phone, informing about the elective courses and the selection procedure, as well as the application form. In the event of a competition for a particular elective component, priority will be given to the person with the highest academic achievement, while the person with the low academic achievement will be enrolled in the next elective course of his or her choice.

The Georgian Technical University Curriculum Management Instruction provides information on organizing the curriculum, selecting curriculum components, evaluating student achievement, appealing against appraisal of learning outcomes, student and financial agreements and student credit accumulation, internships and appraisals, undergraduate research project / Detailed information can be found at the following e-mail address (see <https://gtu.ge/Study-Dep/Forms/Forms.php>)

## Program Objective

**Objective 1:** Using the fundamental theses of the natural sciences and mathematics, to teach graduates modern approaches to managing civil engineering projects, identifying and solving engineering problems in the field, and the latest technical tools and technologies.

**Objective 2:** To understand the fundamental scientific issues of civil engineering, to train practicing and innovative engineers who, with appropriate theoretical knowledge and professional competencies, will be able to participate and contribute to the social, technical and business challenges in the field of civil engineering.

**Objective 3:** To provide graduates with a solid foundation for continuing their studies and constant professional development in the field of civil engineering.

## Learning Outcomes/Competence (general and professional)

1. With extensive knowledge of the fundamental theories of engineering, natural sciences, and mathematics, critically understands theories and principles in the field;
2. Explains some of the most modern aspects of civil engineering, including planning, design, testing, and construction guidance for buildings and structures;
3. In the field of civil engineering, using cognitive and practical skills, standard and some of the latest methods, in compliance with ethical, labor and safety norms, solves such complex and unforeseen problems that meet the defining requirements of environmental protection, safety and well-being of the population;
4. Plans and conducts experiments in accordance with pre-defined guidelines, implements a practical project, analyzes and interprets data, uses them to formulate appropriate engineering assessments and conclusions;
5. Conducts clear and comprehensible communication with the audience, specialists and non-specialists in context-appropriate forms, using information and communication technologies, ideas related to the field, existing problems and ways to solve them;
6. Involved in interdisciplinary team activities, with members of which he/she creates a collaborative environment to perform the set tasks;
7. Plans continuous professional development, identifies his/her further learning needs and implements it with a high degree of independence.

## Methods of Achieving Learning Outcomes (Teaching - Learning)

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

Due to the specifics of the particular course in the learning process the following activities listed below are provided for teaching and learning methods and which are reflected in the relevant teaching courses (syllabus):

### Relevant activities of teaching-learning methods:

Discussion / Debate, Cooperative Learning, Collaborative Working, Problem-Based Learning (PBL), Heuristic Teaching, Case Study, Brain Storming, Role-playing and situational games, Demonstration, Induction, Deduction, Analysis, Synthesis, Verbal or oral communication, written work, laboratory activity, explanation, action-oriented teaching, project development and presentation.

The relevant activities of the teaching-learning methods are used in the learning process, depending on the specifics of the training course, which are reflected in the curricula (syllabi).

## 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 to work 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.

In the component of the educational program, in case of receiving FX, an additional exam is appointed, not less than 5 days after the announcement of the results.

The number of points obtained in the final assessment is not added to the grade obtained by the student on the additional exam.

The grade obtained on the additional examination is the final grade and is reflected in the final grade of the educational program component.

In case of getting 0-50 points in the final grade of the educational component, or if the student does not exceed the minimum competency threshold in the final/additional exam, the student will be given a grade of F-0.

In each component, the program part of the assessment of the level of achievement of student learning outcomes consists of midterm assessment and final exam. Midterm assessment in turn includes ongoing activity and midterm exam.

Each form and component of the assessment determines its share of the final assessment from the total assessment score (100 points). In particular, the maximum score of the midterm assessment is not more than 60, and the maximum score of the final exam is not less than 40.

Each form of assessment includes an assessment component/component that includes the assessment method/methods, and the assessment method/ methods is measured by the assessment criteria.

A student who has obtained at least a minimum positive grade in the intermediate assessment component (s) in accordance with the course curriculum (not less than 30 points in total), has completed and presented the minimum number of works specified in the program in the form of documentary material.

Detailed information is given at the following e-mail address: "Instruction for managing the educational process at the Georgian Technical University" <https://gtu.ge/Study-Dep/Forms/Forms.php>

## Sphere of Employment

Graduates will be able to get employment in civil construction, hydraulic structures, construction-design-construction firms, construction profile services of city halls, municipalities and ministries, construction and development firms, In construction expert bureaus, examination and testing laboratories. In construction materials and goods manufacturing enterprises, in open-cast mine for building materials extraction, water supply and sewerage systems treatment plant profile design organizations, municipal service utilities, construction of railways, roads, water supply systems, hydropower systems and other. (The graduate will be employed in the positions provided by the qualifications awarded by the program).

## Potential for Further Education

Master's Educational Programs

## Human and Material Resources Required to Implement the Program

The program is provided with appropriate human and material resources. For more information see attached Documents.

The Number of Syllabi Attached: 59

## Courses in the Program

№	Course	Admission Prerequisites	ECTS Credits							
			Year I		Year II		Year III		Year IV	
			Semester							
			I	II	III	IV	V	VI	VII	VIII
1	Calculus C1 ABET 1	N/A	8							
2	General and Inorganic Chemistry A	N/A	7							
3	The Basics of Biology	N/A	6							
4	Oral communication	N/A	4							
5	<b>Elective Humanitarian Components</b>									
5.1	History and Culture of Georgia	N/A	5							
5.2	Introduction to Philosophy	N/A								
5.3	Sociology	N/A								
6	Calculus C2 ABET2	Calculus C1 ABET1		7						
7	General Physics 1A	N/A		7						
8	Surveying for Civil Engineering	N/A		6						
9	Interpersonal Communication	Oral communication		5						
10	Computer Engineering Graphics in Civil Engineering	N/A		5						
11	Introduction to Civil Engineering	N/A			3					
12	Calculus C3 ABET3	Calculus C2 ABET2			7					
13	General Physics 2B	General Physics 1A			6					
14	Theoretical Mechanics (Statics)	Calculus C1 ABET1			5					
15	Statistical methods in construction	Calculus C1 - ABET1			5					
16	Technical communication	N/A			4					
17	Business and Professional Communication	Interpersonal Communication				4				
18	Linear Algebra ABET	N/A				6				

№	Course	Admission Prerequisites	ECTS Credits							
			Year I		Year II		Year III		Year IV	
			Semester							
			I	II	III	IV	V	VI	VII	VIII
19	Theoretical Mechanics (Dynamics)	Theoretical Mechanics (Statics)				5				
20	Introduction to the Building Materials	General and Inorganic Chemistry A				5				
21	Antitypy	Theoretical Mechanics (Statics)				5				
22	The Principles of Economics	N/A				5				
23	Construction Methods	Introduction to the Building Materials					5			
24	Geotechnical Engineering	N/A					5			
25	Fluid Mechanics	Theoretical Mechanics (Statics)					5			
26	Geographic Information Systems Fundamentals	N/A					6			
27	Construction machinery and equipment	N/A					3			
28	Basics of Structural Mechanics	Antitypy					6			
29	Introduction to Environmental Engineering	General and Inorganic Chemistry A, The Basics of Biology.						6		
30	Basis of the Construction of Transport Infrastructure	N/A						6		
31	Hydrology and Hydrometric	Fluid Mechanics						6		
32	Applied Hydraulics	Fluid Mechanics						6		
33	Design of Buildings with Reinforced Concrete Structures	Basics of Structural Mechanics						6		
<b>Elective courses in the field of basic education 1</b>										
34.1	Open Channel Hydraulics	Fluid mechanics							6	
34.2	Foundation base Engineering and building structure deformation	Geotechnical Engineering								
34.3	Traffic Engineering Design	N/A								
<b>Elective courses in the field of basic education 2</b>										
35.1	Water Supply and Distribution Systems	Applied Hydraulics							6	
35.2	The basics of construction of hydraulic structures	Applied								

№	Course	Admission Prerequisites	ECTS Credits							
			Year I		Year II		Year III		Year IV	
			Semester							
			I	II	III	IV	V	VI	VII	VIII
		Hydraulics								
35.3	Highway's Engineering	Basis of the Construction of Transport Infrastructure								
<b>Free components</b>										
36.1	Democracy and Citizenship	N/A								
36.2	Construction contracts and state procurement organizing	N/A								
36.3	Construction Project Management	N/A							5	
36.4	Principles of marketing	N/A								
37	Principles of Construction Estimating	Construction Methods							5	
38	Principles of construction economics	The Principles of Economics							4	
39	Preliminary Project Practice	Is allowed in case of completing not less than 120 credits for required educational courses.							4	
<b>Elective courses in the field of basic education 3</b>										
40.1	Water Treatment Engineering	Applied Hydraulics								
40.2	Steel Constructions	Basics of Structural Mechanics								6
40.3	Design of Temporary Structures	Geotechnical Engineering								
<b>Elective courses in the field of basic education 4</b>										
41.1	Wastewater Treatment Engineering	Applied Hydraulics								
41.2	Irrigation and Drainage	1. Applied Hydraulics 2. Hydrology and Hydrometry								6
41.3	Basics to Railway Construction	N/A								
42	Safety Equipment on Construction	N/A								5
<b>Elective courses in the field of basic education 5</b>										
43.1	Construction Process Management	Construction Methods								6
43.2	Solid and Hazardous Waste Engineering	Introduction to								

№	Course	Admission Prerequisites	ECTS Credits								
			Year I		Year II		Year III		Year IV		
			Semester								
			I	II	III	IV	V	VI	VII	VIII	
		Environmental Engineering									
43.3	Ports and Marine Structures	1. Hydraulics and Hydrometry 2. Applied Hydrology									
44	Bachelor's project	Preliminary Project Practice									7
<b>Per Semester</b>			<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>
<b>Per Year</b>			<b>60</b>		<b>60</b>		<b>60</b>		<b>60</b>		
<b>Total</b>			<b>240</b>								

## Program Curriculum

№	Code	Course	ECTS Credits\ Hour	Lecture	Seminar (working in group)	Practical work	Laboratory	Practice	Course work/Project	Midterm Exam	Final Exam	Independent work
1	MAS14908E2-LP	Calculus C1 ABET1	8/200	30		45				1	2	122
2	PHS14404E2-LPB	General and Inorganic Chemistry A	7/175	15		15	30			1	2	112
3	BRS19501E1-LP	The Basics of Biology	6/150	30		30				1	2	87



<b>№</b>	<b>Code</b>	<b>Course</b>	<b>ECTS Credits/ Hour</b>	<b>Lecture</b>	<b>Seminar (working in group)</b>	<b>Practical work</b>	<b>Laboratory</b>	<b>Practice</b>	<b>Course work/Project</b>	<b>Midterm Exam</b>	<b>Final Exam</b>	<b>Independent work</b>
4	BUA36601E3-P	Oral communication	4/100			30				1	1	68
5	<b>Elective Humanitarian Components</b>											
5.1	HEL28812E1-LS	History and Culture of Georgia	5/125	15	30					1	1	78
5.2	HEL28712E1-LS	Introduction to Philosophy	5/125	15	30					2	2	76
5.3	HEL28912E1-LS	Sociology	5/125	15	30					1	1	78
6	MAS15008E2-LP	Calculus C2 ABET2	7/175	30		45				1	2	97
7	PHS57508E1-LPB	General Physics 1A	7/175	15		15	30			1	2	112
8	PHS45603E1-LP	Surveying for Civil Engineering	6/150	30		30				1	2	87
9	BUA36701E3-P	Interpersonal Communication	5/125			45				1	1	78
10	ICT13301E4-PB	Computer Engineers Graphics in Civil Engineering	5/125			15	30			1	2	77
11	AAC45001E3-L	Introduction to Civil Engineering	3/75	30						1	2	42
12	MAS15108E2-LP	Calculus C3-ABET3	7/175	30		45				1	2	97
13	PHS57608E1-LPB	General Physics 2B	6/150	15		15	30			1	2	87
14	MAS31901E2-LPB	Theoretical Mechanics (Statics)	5/125	15		15	15			1	2	77
15	MAS32001E2-LP	Statistical methods in construction	5/125	30		15				1	2	77
16	BUA36801E3-P	Technical communication	4/100			30				1	1	68
17	BUA36901E3-P	Business and Professional Communication	4/100			30				1	1	68
18	MAS14008E2-LP	Linear Algebra ABET	6/150	30		30				1	2	87
19	MAS32101E2-LPB	Theoretical Mechanics (Dynamics)	5/125	15		15	15			1	2	77
20	AAC45101E3-LB	Introduction to the Building Materials	5/125	15			30			1	2	77
21	EET76001E3-LPB	Antitypy	5/125	15		15	15			1	1	78
22	SOS10912E2-LS	The Principles of Economics	5/125	15	30					2	2	76
23	AAC45201E3-LP	Construction Methods	5/125	15		30				1	2	77
24	PHS38101E2-LB	Geotechnical Engineering	5/125	15			30			1	2	77
25	AAC45301E3-LB	Fluid Mechanics	5/125	15			30			1	2	77
26	PHS45703E1-LP	Geographic Information Systems Fundamentals	6/150	15		45				1	2	87

No	Code	Course	ECTS Credits/ Hour	Lecture	Seminar (working in group)	Practical work	Laboratory	Practice	Course work/Project	Midterm Exam	Final Exam	Independent work
27	TRS14401E1-LB	Construction machinery and equipment	3/75	15			15			1	1	43
28	EET75901D3-LPK	Basics of Structural Mechanics	6/150	15		30			15	1	2	87
29	EET27101E2-LP	Introduction to Environmental Engineering	6/150	30		30				1	2	87
30	TRS14501E1-LS	Basis of the Construction of Transport Infrastructure	6/150	30	30					1	2	87
31	AAC45401E3-LP	Hydrology and Hydrometric	6/150	30		30				1	2	87
32	AAC45501E3-LP	Applied Hydraulics	6/150	30		30				1	2	87
33	AAC30601E3-LPK	Design of Buildings with Reinforced Concrete Structures	6/150	15		15			30	1	2	87
<b>Elective courses in the field of basic education 1</b>												
34.1	AAC45601E3-LP	Open Channel Hydraulics	6/150	30		30				1	2	87
34.2	AAC45701E3-LPK	Foundation base Engineering and building structure deformation	6/150	15		30			15	1	2	87
34.3	TRS14601E1-LP	Traffic Engineering Design	6/150	30		30				1	2	87
<b>Elective courses in the field of basic education 2</b>												
35.1	AAC45801E3-LK	Water Supply and Distribution Systems	6/150	30					30	1	2	87
35.2	AAC45901E3-LP	The basics of construction of hydraulic structures	6/150	30		30				1	2	87
35.3	AAC46001E3-LP	Highway's Engineering	6/150	30		30				1	2	87
<b>Free components</b>												
36.1	LAW16211E2-LS	Democracy and Citizenship	5/125	15	30					2	2	76
36.2	AAC46101E3-LP	Construction contracts and state procurement organizing	5/125	15		30				1	1	78
36.3	BUA37001E3-LS	Construction Project Management	5/125	15	30					1	2	77
36.4	BUA37101E3-LS	Principles of marketing	5/125	15	30					1	1	78
37	AAC46201E3-LP	Principles of Construction Estimating	5/125	15		30				1	2	77

<b>№</b>	<b>Code</b>	<b>Course</b>	<b>ECTS Credits/ Hour</b>	<b>Lecture</b>	<b>Seminar (working in group)</b>	<b>Practical work</b>	<b>Laboratory</b>	<b>Practice</b>	<b>Course work/Project</b>	<b>Midterm Exam</b>	<b>Final Exam</b>	<b>Independent work</b>
38	AAC30701E3-LS	Principles of Construction Economics	4/100	15	15					1	2	67
39	BUA37201E3-R	Preliminary Project Practice	4/100					30		1	2	67
<b>Elective courses in the field of basic education 3</b>												
40. 1	AAC46301E3-LP	Water Treatment Engineering	6/150	30		30				1	2	87
40. 2	AAC30801E3-LBK	Steel Constructions	6/150	15			15		30	1	2	87
40. 3	AAC30901E3-LP	Design of Temporary Structures	6/150	30		30				1	2	87
<b>Elective courses in the field of basic education 4</b>												
41. 1	AAC46401E3-LP	Wastewater Treatment Engineering	6/150	30		30				1	2	87
41. 2	AAC46501E3-LK	Irrigation and Drainage	6/150	30					30	1	2	87
41. 3	AAC46601E3-LS	Basics to Railway Construction	6/150	30	30					1	2	87
42	HHS20201E2-LS	Safety Equipment on Construction	5/125	30	15					1	1	78
<b>Elective courses in the field of basic education 5</b>												
43. 1	AAC31001E3-LS	Construction Process Management	6/150	30	30					1	1	88
43. 2	EET27201E2-LP	Solid and Hazardous Waste Engineering	6/150	30		30				1	2	87
43. 3	AAC46701E3-LP	Ports and Marine Structures	6/150	30		30				1	2	87
44	AAC31101E3-K	Bachelor's Project	7/175						70	1	2	102

Program Supervisor/Supervisors

Alexander Bagration-Davitashvili

Head of Quality Assurance Service  
of the Faculty of Civil Engineering

Marina Javakhishvili

Dean of the Faculty

Zurab Gvishiani

**Agreed with**

Quality Assurance Service of GTU

David Makhviladze

**Approved by**

Faculty of Civil Engineering

At the Session of the Faculty Council

7.04.2022, № 3

Chairman of the Faculty Council

Zurab Gvishiani