

Ilia State University
Bachelor Programme
Curriculum

Faculty	Faculty of Business, Technology and Education
ProgramTitle	Civil Engineering (Major)
Awarded Academic Degree/Qualification	The Degree of Bachelor of Civil Engineering
Program Duration/Volume (Semester, number of credits)	8 Semesters, 252 ECTS (1 ECTS- 25 hours): <ul style="list-style-type: none"> General Education - 56 ECTS; Maths, Physics and Chemistry - 60 ECTS; Major program -136 ECTS.
Language of Instruction	English
The Date of Programme Development and Update	Program is developed in 2019 and can be subject to periodic revision.
Admission Requirements to the Programme	
<p>The Georgian citizens must pass the Unified National Exams. Admission for the program requires minimal competence levels in following Unified National Exams:</p> <ul style="list-style-type: none"> English Language - 75% + 1; Georgian Language determined by National Assessment and Examinations Center; Mathematics – 50% + 1 <p>International applicants should follow the rules and terms defined by the Ministry of Education, Science, Culture and Sports of Georgia (http://www.mes.gov.ge/content.php?id=1131&lang=geo) according to the order №224/N (December 29, 2011). The Applicant should prove English language qualification equivalent to CEFR level B2 or higher. To prove the English qualification, the applicant must submit one of the following:</p> <p>a) an official international language certificate (the main certificates and minimum scores accepted are given below*);</p> <p>b) an English Proficiency Statement from the university, high school or college, confirming that English was the language of instruction;</p> <p>c) a certificate issued by a local or international English language instruction provider (e.g. language school), confirming the acquisition of B2 level as a result of a language course the applicant attended.</p> <p>d) Or apply and take University’s institutional paper based or online language test aligned with CEFR level B2.</p> <p>Note: The English language requirement may be waived if the applicant is a native of or graduated from an English medium high school / university in countries, official language of which is English.</p> <p>* The following are the minimum English test scores for admission: TOEFL</p> <ul style="list-style-type: none"> paper based PBT 513 internet based iBT 65 computer based CBT 183 <p>IELTS</p> <ul style="list-style-type: none"> Academic (Band 5.5) <p>Cambridge ESOL (English for Speakers of Other Languages)</p> <ul style="list-style-type: none"> Certificate of Advanced English CAE: 160/Level B2 (also grades A/B/C) First Certificate in English FCE: 160/Grade C (also grades A/B) Business English Certificate (Higher) BEC: 45/Level B2 (also grades A/B/C) Business English Certificate (Vantage) BEC: 60/Grade C (also grades A/B) Business Language Testing Service BULATS: 60 overall PTE (General level 3) PTE Academic (59-75 points) 	

TELC (The European Language Certificates)

- TELC English B2: Pass

Michigan (Cambridge Michigan)

- Examination for the Certificate of Proficiency in English ECPE: Low Pass
- Examination for the Certificate of Competency in English ECCE: Pass
- MELAB: B2

International Students shall undergo paper and online based Entry Tests in Maths; this test will be administered by the University to a similar level as required by Georgian students above i.e.:

- Ilia University Entry Level Maths Test 50% + 1;

Program Objectives

Mission of the Program:

The mission of the Civil Engineering at Ilia State University is to prepare our students for careers in their chosen area of specialisation. As such, the program aims to provide quality instruction, advisory services and student support to ensure students achieve their goals and gain the knowledge and experience required to succeed in the demanding field of civil engineering.

The Program Educational Objectives of the Civil Engineering program are closely aligned with Ilia University's mission of advancing science to the benefit of society locally and internationally. This is especially true in a people serving profession such as civil engineering which is entirely focused on bettering the standard of living of society at large. With an internationalised focus and teaching in English language with the aim to involve both local and international students in the program, we hope for a high level of internationalisation and future cooperation between the graduates across borders.

This program focuses on the delivery of interdisciplinary courses to create well rounded holistic thinkers, problem solvers and future leaders in the civil engineering fields of water, transport, structural and geotechnical engineering. To complement the interdisciplinary learning promoted by this program, students will have the ability to take business administration courses to acquire managerial skills that are instrumental to a successful professional career.

Within the programme, fundamental courses in maths, physics, chemistry and additional natural science electives build to later courses in engineering design. The program is structured to ensure adequate incremental practical and theoretical knowledge in the field of Civil Engineering. Programme graduates will be competitive professionals in Georgia or abroad in areas of project and engineering design and management. They will also be able to continue their education at the master level of studies.

In addition, the programme is oriented towards the development of transferable skills such as effective oral and written communication in at least one other non-native speaking language so as to develop multicultural awareness. We expect that our graduates will use these skills in whichever sector they consider advancing their careers, whether it be in the private, government or educational sector.

Program Educational Objectives:

Graduates of the Ilia University Civil Engineering Program will meet the following Program Educational Objectives:

- Objective 1:** Graduates will collaborate in a team environment as a civil engineer;
- Objective 2:** Graduates will be ready for leadership roles within the civil engineering profession;
- Objective 3:** Graduates will pursue life-long learning in engineering which may include a graduate degree.

Learning Outcomes and Competencies

The following Learning Outcomes will be assessed for each student:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;
3. An ability to communicate effectively with a range of audiences;
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts;
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions;
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Teaching Methods

- Lectures and Seminars/Written and verbal method;
- Laboratory Work;
- Practical Work;
- Project Work Individually and in Teams.

Note: Specific teaching methods are identified for each individual program component and are listed in relevant syllabi.

Program Structure

Structure of Civil Engineering Bachelor Program:

- **Maths, Physics and Chemistry - 60 ECTS**
- **General Education - 56 ECTS** (including 24 ECTS of electives from business administration and natural sciences; minimum of 6 ECTS natural science and 6 ECTS business administration)
- **Major program - 136 ECTS** (including 24 ECTS of electives)

Besides the **252 ECTS** that students are expected to accumulate during the course of their studies, they will to pass a **Comprehensive Knowledge Exam** designed to test student's knowledge on all prior Major Course subject areas. The Exam will include 150 either multiple choice questions or questions split into sub-questions (i.e. a question may need to show many steps of mathematical equations – these questions will be split into sub-questions for each mathematical step. Students must achieve 33% on the test. In case students meet the designated threshold, they will be eligible to proceed with their CIVE 495 Senior Design Project in the final semester of their studies. In case students fail to achieve the threshold, they will be excluded from the program. Each student will be allowed to re-sit the exam one additional time (test will be different) in case their achievement on the test falls short of the benchmark.

Maths, Physics and Chemistry Foundation Courses:

60 ECTS of Foundation Maths, Physics and Chemistry with associated laboratories ensures a good base for continued advanced learning for our civil engineering students.

General Education:

General Education includes courses (**56 ECTS**) in line with the philosophical direction of Ilia State University including “Construction and Culture” specifically tailored for engineers and the following language courses:

- Practical Course of Georgian for Foreigners / Practical Course of German/English - **12 ECTS ***

**International students must pass both Practical Courses of Georgian; local students must pass Practical Courses of German or English language.*

Approved Electives within the General Education component:

The approved electives within the general education module are designed to give each student an individual direction and pursue subjects according to their interest in the areas of Natural Science and Business Administration. Students will choose four elective courses with at least one approved business course and one natural sciences course to strengthen their depth in science and business and to assist our students with their future leadership and career development goals.

Major Program:

- Mandatory courses of Civil Engineering Bachelor program – **108 ECTS (including 8 design ECTS)**
- Mandatory/elective courses Civil Engineering Bachelor Program – **24 ECTS**
- Internship – **4 ECTS**

Mandatory/elective course choices: Students choose four courses from the following six areas (no more than 1 in each area – this ensures a broad knowledge base that can be further specified in graduate studies).

Water and Environmental – Civil Engineering (Applied Hydrology).

Transportation – Civil Engineering (Traffic Engineering, Highway Engineering).

Structural – Civil Engineering (Structural Engineering – 2 options).

Geotechnical – Civil Engineering (Geotechnical Engineering).

Environmental Engineering (Environmental Management)

Construction Engineering (Construction and Management)

Capstone Design Project and Internship:

During the last two semesters of study, students must participate in an internship (4 ECTS) and a Senior Capstone Design Project (8 ECTS). The main purpose of both the design and internship experience is to prepare students for the real-world challenges in the field of Civil Engineering by exposing them to industry and allowing them to use their developed problem-solving skills to find engineering design solutions to industry problems. The students will also develop their managerial skills through planning, design and meeting deadlines together with industry participation. Finally, students will improve their communication, presentation and teamwork skills during these practical components of the programme.

Senior-design teams will generally consist of 3 to 6 students under the direction of a faculty mentor/supervisor and with an agreed industry sponsor that will be involved in the forerunning semester for collaboration with the students in the Project Concept Development phase and in the final semester as Project Reviewer. Even though students will be working in groups, each student will need to submit an individual activity report showing which tasks they have were assigned by the group and agreed by the Faculty advisor and how they have managed to complete their individual tasks. All group members will also evaluate each other anonymously as to each group members active involvement, availability and ability to meet team set deadlines.

The Internship (4 ECTS) may or may not be within the industry partner organization sponsoring the Capstone project. Detailed description and assessment of Internship is described in the syllabus.

Student Evaluation

Student assessment should be based on a **100-point** grading scale:

- (A) 91-100 Excellent
- (B) 81-90 Very Good
- (C) 71-80 Good
- (D) 61-70 Satisfactory

(E) 51-60 Sufficient

(FX) 41-50 Unsatisfactory - meaning a student needs more effort to pass an examination and is given an extra chance to pass an additional examination through independent work.

(F) Failure - 40 and less of the maximum of grades, meaning the student's effort is not enough and he has to learn the subject anew.

Note: The detailed assessment components and criteria are described in more details in the respective syllabus of each course of the program.

Employment Opportunities

Graduated students can be employed in a variety of organizations related to planning, design, construction, management, maintenance, repair and renewal of infrastructure components such as building, transportation, energy and water systems. The employment scope can include:

- Construction management and engineering design of houses and industrial buildings;
- Transportation construction and asset management of roads and railways with associated tunnels and bridges, Traffic analysis and transportation planning;
- Water supply, sewerage, wastewater treatment and reservoirs design and construction;
- Inspection and assessment of existing buildings and strengthening of them;
- Public Enterprises such as Municipalities, and government owned infrastructure companies;
- Diagnostics and repair of a wide range of engineering equipment (household, medical, military, etc.);
- Renewable energy systems design and construction management.

Necessary Auxiliary Conditions /Resources For Learning

The faculty has the **material resources** that are used in teaching and technical preparation:

- Auditoriums for lecture;
- Civil Engineering teaching laboratories;
- Computer classes;
- University Library;
- Electronic platform of the University – Argus;
- Teaching and Learning Staff Development Center.

Partner organizations, supporting development and implementation of the program:

- San Diego State University Georgia;
- PROGRESI Ltd. (Engineering Center of Computer Aided Design);
- Caucasus Road Project Ltd. (Road Construction Company);
- Saunders Group Ltd Infrastructure Consultants;
- Cubicon LTD Structural Engineering Design;
- ILF Consulting Engineers;
- EPTISA Consulting Engineers;

CIVIL ENGINEERING PROGRAMME

1st Term (Fall)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
	Introduction to Modern Thought I		29	6	Gia Nodia, Tamar Tolordava
	Practical Course of Georgian (German/English Georgians)		52	6	Maia Damenia/Nino Tsulaia/Nino Rukhadze
CIVE 100	Introduction to Civil Engineering		17	2	Michael Saunders
CHEM 100	Introduction to General Chemistry		62	8	Ketevan Kupatadze
CIVE 121	Computer Graphics for the Built Environment		62	6	Ia Kupatadze
CONE 101	Construction and Culture		17	2	Choong Hoon Lee
Total			222	30	
2nd Term (Spring)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
	Introduction to Modern Thought II		31	6	Gia Nodia, Tamar Tolordava
MTH 150	Calculus I	Precalculus or ISU Test	62	6	Giorgi Khimshashvili
	Practical Course of Georgian (German/English Georgians)	Practical Course I	50	6	Maia Damenia/Nino Tsulaia/Nino Rukhadze
	Academic Techniques		34	6	Maia Rogava
PYS 195	Physics I including Lab	conc. MTH 150	77	8	Giorgi Dalakishvili
Total			254	32	
3rd Term (Fall)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
MTH 151	Calculus II	MTH150 Calculus I	62	6	Nino Manjavidze
STAT 250	Probability and Statistics	MTH150 Calculus I	48	6	Nato Jorjashvili
CIVE 202	Statics	PYS195, conc. MTH 151	47	6	Mark Donghak Kim
CIVE 220	Civil Engineering Computer Applications	MTH150 Calculus I	47	6	Mikheil Elashvili
CHEM 200	General Chemistry II	CHEM100 Introduction to General Chemistry	62	8	Ketevan Kupatadze
Total			266	32	
4th Term (Spring)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
PYS 196	Physics II	MTH151 Calculus II	47	6	Giorgi Dalakishvili
MTH 252	Calculus III	MTH151 Calculus II	62	6	Giorgi Khimshashvili
ME 220	Dynamics	CIVE 202 Statics	47	6	Mark Donghak Kim
CIVE 218	Surveying for Civil Engineering and Construction	MTH 151, STAT 250	47	6	Mikheil Elashvili
AE 280	Numerical Analysis	MTH151 Calculus II	47	6	David Tutberidze
Total			250	30	
5th Term (Fall)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
CONE 330	Principles of Engineering Economy	MTH151 Calculus II	47	6	Dimitri Japaridze
ME 240	Introduction to Engineering Materials	CHEM 200, CIVE 202	47	6	Mark Donghak Kim
AE 340	Fluid Mechanics	MTH151, ME 220	47	6	Ozgur Kisi
CIVE 301	Introduction to Solid Mechanics (Including Lab)	CIVE 202 Statics	77	8	Igor Timchenko
	Approved Elective		32	6	
Total			250	32	
6th Term (Spring)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
CIVE 481	Introduction to Transportation Engineering	STAT 250, CIVE 218	47	6	Michael Saunders
CIVE 321	Structural Analysis I	CIVE 301 Intro to Solid Mechanic	47	6	Igor Timchenko
ENV 355	Environmental Engineering	CHEM 200	48	6	Ketevan Kupatadze
CIVE 444	Applied Hydraulics (Including lab)	AE 340 Fluid Mechanics	77	8	Ozgur Kisi
	Approved Elective		32	6	
Total			251	32	

CIVIL ENGINEERING PROGRAMME					
7th Term (Fall)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
CIVE 494	Senior Design Project Conception	80 ECTS in Major Program	18	2	Michael Saunders
CIVE 462	Geotechnical Engineering (Including lab)	CIVE 301 Intro to Solid Mechanics	92	8	Archil Magalashvili
	Approved Elective		32	6	
	Internship		77	4	
	Elective 1 (Major - Mandatory)			6	
	Elective 2 (Major - Mandatory)			6	
Total			219	32	
8th Term (Spring)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
CIVE 495	Senior Design Project	CIVE 494, Compr.Knowledge Exam	50	6	Michael Saunders
CIVE 421	Reinforced Concrete Design	CIVE 321 Structural Analysis I	47	6	Igor Timchenko
	Elective 3 (Major - Mandatory)			6	
	Elective 4 (Major - Mandatory)			6	
CIVE 401	Civil Engineering and Society		17	2	Michael Saunders
	Approved Elective		32	6	
Total			146	32	
Elective Courses (for Major)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
CV521 Fall	Structural Analysis II	CIVE 321 Structural Analysis I	47	6	Igor Timchenko
CV525 Fall	Design of Steel Structures	CIVE 321 Structural Analysis I	47	6	Igor Timchenko
CV445 Spr.	Applied Hydrology	CIVE 444 Applied Hydraulics	62	6	Ozgur Kisi
CN401 Spr.	Construction Planning and Scheduling	CIVE 321, STAT 250	77	6	Choong Hoon Lee
CV482 Fall	Highway Engineering	CIVE 481 Intro to Transpor. Eng.	47	6	Michael Saunders
CV580 Fall	Traffic Engineering Design	CIVE 481 Intro to Transpor. Eng.	47	6	Michael Saunders
EN441 Spr.	Water Treatment Engineering (incl. Wastewater)	ENV 355, CIVE 444	47	6	Ketevan Kupatadze
CV465 Spr.	Foundation Eng. And Earth Retaining Structures	CIVE 462 Geotechnical Eng.	47	6	David Gigineishvili
Elective Courses (for Business Administration (Tourism, Management) (Major))					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
Fall	Business Communications		32	6	Givi Chanukvadze
Fall	Essentials of Management		32	6	Nino Tandilashvili
Spring	Introduction to Marketing		32	6	Natalia Shelegia
Spring	Basics of Business		32	6	Nino Tandilashvili
Fall	Basics of Entrepreneurship	Basics of Business	32	6	Irine Guruli
Spring	Introduction to Organizational Behaviour	Essentials of Management	32	6	Berika Shukakidze
Elective Courses (for Natural Sciences)					
Code	Course Title	Prerequisites	Cnt.hrs	ECTS	Instructor
Biol 100	Biology for Engineers		32	6	Elene Zhuravliova
Ecol 100	Ecology - Ecosystem		32	6	Archil Magalashvili
Geol 100	Geology		32	6	Archil Magalashvili
60	Foundation Maths and Science				
24	Approved Elective				
32	Compulsory GE				
112	Major (includes 8 design ECTS)				
24	Major Electives				
252					
Note:	*Comprehensive Knowledge Exam as a prerequisite				
Note:	Approved electives must include at least one Natural Science elective and one Business Administration elective				
Note:	Math 140 (Precalculus) is compulsory for all students in the first semester unless passing an ISU administered Pre-Calculus test before beginning the semester; This course does not count for credit to the degree				

Mapping of Major Courses to Learning Outcomes

Learning Outcomes \ Courses		CIVE 100	CIVE 121	CIVE 202	CIVE 220	CIVE 218	ME220	CIVE 301	CONE330	ME240	AE340	CIVE 321	ENVE355	CIVE 401	CIVE 421	CIVE 444	CIVE 462	CIVE 465	CIVE 481	INTERNSHP	CIVE 494	Comprehensive Knowledge Exam	CIVE 495	CONE 101	CIVE 521	CIVE 525	CIVE 482	CIVE 580	CIVE 445	CONE 401	ENVE 441	CIVE 465		
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.		x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x			2.5	x			x	x	x	x	x	x	x	x	
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	x	x	x	x	x		x	x		x	x			x	x					x	2.5	2.5			x	x	x	x	x	x	x	x	
3	An ability to communicate effectively with a range of audiences.		x		x								x	x						x	x		2.5	x							x			
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	x					x						x	x						x	x	2.5	x	x					x					
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	x																		x	2.5		x	x				x						
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.		x		x	x		x	x			x			x	2.5	x	x				2.5*	x				x	x	x	x	x		x	
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.													x	x					2.5	x		x				x				x			
<i>Benchmarked Courses (benchmark measured from 5)</i>																																		
NOTE: <i>Comprehensive Knowledge Exam tests student's knowledge on all prior Major Course subject areas - each area tested is converted to result from 5 with benchmark 2.5.</i>																																		
<i>* In the comprehensive exam, test data is provided and student has to analyse this data and produce conclusions</i>																																		