Informatics

Bachelor’s Educational Programme — Annotation | 240 credits | Georgian Technical University

Programme admission prerequisite

The right to study at bachelor’s level is granted only to a holder of a state certificate confirming complete general education, or of a document equivalent to it, who is enrolled in accordance with the procedure established by the legislation of Georgia.

Programme objectives

The objective of the educational programme is to prepare competitive bachelors of informatics who will be able:

- to develop the design of computer systems and of the computing environment and to develop user applications in the field of informatics, and to solve the relevant tasks and problems;
- to operate, administer and service software, hardware and software-hardware systems in the field of informatics;
- to apply the relevant methods, techniques and tools — software and hardware means — in various industrial branches, on the basis of knowledge founded on the latest achievements of information and communication technologies.

Learning outcomes / competences (general and professional)

- Comprehends the main theses of information and communication technologies and of the fundamental and natural sciences, which he/she uses in order to identify and formulate problems connected with the speciality and to determine the ways of solving them;
- Characterises, from the wide spectrum of tasks of the field of informatics, such modern issues as: management and infrastructure of information technologies, data processing centres, mobile and web technologies, multimedia systems and computer games, information systems for business process management and business analysis, decision support technologies, the Internet of Things and intelligent sensors, SCADA systems, robotics, machine learning, widely used programming languages and technologies, information security;
- In various branches of industry, identifies, formulates and analyses theoretical and practical problems and tasks, draws substantiated conclusions related to them, and solves the said problems and tasks using the modern methods and techniques and the software and hardware tools of information systems, decision support systems, information technologies, multimedia systems, computer systems and networks, software engineering, web technologies and artificial intelligence;
- In accordance with predetermined instructions, and using modern methods and tools, designs and implements software, hardware and software-hardware systems and products in the directions of information systems, decision support systems, information technologies, multimedia systems, computer systems and networks, software engineering, web technologies and artificial intelligence;
- Carries out the setup, servicing and administration of software, hardware and software-hardware systems and products in the field of informatics;
- Communicates about ideas, existing problems and tasks and the ways of solving them with specialists and non-specialists in forms appropriate to the context, using information and communication technologies;
- In compliance with professional and ethical norms and professional values, effectively conducts development-oriented professional activity in a group and multidisciplinary context;
- Determines the need for his/her further learning under conditions of the rapid development of the directions and technologies of the field of informatics;
- Independently takes decisions regarding professional and career development.

Student knowledge assessment system

Assessment is carried out on a 100-point scale.

Positive grades:

- A. Excellent — 91–100 points;
- B. Very good — 81–90 points;
- C. Good — 71–80 points;
- D. Satisfactory — 61–70 points;
- E. Sufficient — 51–60 points.

Negative grades:

- (FX) Did not pass — 41–50 points, which means that the student needs to do more work in order to pass and is granted the right to sit an additional examination once on the basis of independent work;
- F. Failed — 40 points or fewer, which means that the work carried out by the student is not sufficient and he/she must study the subject anew.

In the case of an FX, an additional examination is scheduled no earlier than 5 days after the announcement of the results. The grade obtained at the additional examination is not added to the grade obtained in the final assessment.

Detailed information is provided on the GTU website: Instruction for the Management of the Learning Process at Georgian Technical University: https://gtu.ge/StudyDep/Forms/Forms.php

Curriculum

Where several subjects are listed in one row, they form an elective group sharing the same credit value.

Subject	Credits
Engineering Mathematics 1	5
Introduction to Informatics	4
Computer Skills	6
Fundamentals of Programming	6
Introduction to Philosophy History and Culture of Georgia Applied Stylistics of the Georgian Language Applied Psychology Sociology Culture and Modernity Political Science	5
English Language 1 German Language 1 French Language 1 Russian Language 1	5
Engineering Mathematics 2	5
Physics 1	5
Data Structures and Algorithms	5
Computer Engineering Graphics — INF	4
English Language 2 German Language 2 French Language 2 Russian Language 2	5
Fundamentals of Computer Architecture and Organisation (INF)	5

Elements of Discrete Mathematics	5
Physics 2	5
Introduction to Databases and Their Applications	5
Green Computing Occupational Safety	5
Fundamentals of Operating Systems (INF) Fundamentals of the Architecture of Computer Systems	5
English Language 3 German Language 3 French Language 3 Russian Language 3	5
Probability Theory and Applied Statistics System Software	5
Object-Oriented Programming (based on C++/C#) Object-Oriented Programming (based on Java) Object-Oriented Programming (based on Python) Fundamentals of Web Technologies (INF)	5
Electronics Introduction to Web Technologies (HTML, CSS)	5
English Language 4 German Language 4 French Language 4 Russian Language 4	5
Database Design (based on SQL Server and MySQL) Database Design (based on SQL Server and NoSQL) Database Design (based on ORACLE)	5
Physics 3	5
Information Systems Architecture Digital Circuit Engineering Fundamentals of Information Technologies Computer Graphics Tasks of Artificial Intelligence Fundamentals of Software Engineering	6
Object-Oriented Programming and Applications (based on C++/C#) Object-Oriented Programming and Applications (based on Java) Object-Oriented	5

Programming and Applications (based on Python) Fundamentals of Computer Networks (INF) Digital Signal Processing (CEN)	
Design of Web Sites Web Programming (based on PHP) Programming of Web Applications and User Interfaces (XML, AJAX, Angular) Artificial Intelligence in Web Sites	5
Fundamentals of Information Security	5
Accounting Information Systems and Technologies Classical Models of Selection and Decision Making Decision Making on the Basis of Fuzzy Data Modern Methods and Technologies of Decision Making in Conflict Situations (INF) Structural Organisation of the Computer General Electrical Engineering Fundamentals of Multimedia Technologies Web Programming (based on JavaScript) Fundamentals of Multiparadigm Programming Based on the Python Language Fundamentals of Multiparadigm Programming Based on the Java Language Natural Language Processing	5
Analysis of Organisational Systems Information Management of the Organisation Analysis and Management of Business and Social Processes Internet of Things Strategy of Information Technologies Image Processing and Animation Development of the User Web Interface Using a Framework Object-Oriented Analysis and Design of Systems (INF) Fundamentals of Machine Learning	5
Strategy of Information Systems Solving Decision-Making	4

Tasks by Means of MS Excel Analysis of Statistical Data by Means of MS Excel Intelligent Sensors Introduction to Controllers Technology of Audio-Video Information Processing (INF) Object-Oriented and Visual Programming in Python Programming for Computer Networks Distributed and Parallel Computing Oracle Distributed Database Management System (INF) IT Analytics	
Banking and Financial Information Systems and Technologies Medical Information Systems and Technologies Geoinformation Systems Risk Management Technology Architecture of Microcontrollers Accounting Information Systems and Technologies Computer Vision Programming of Applications and Data Management Technologies of Social Networks Development of the Server Web Interface Using a PHP Framework	5
Administration of Computer Networks Human-Computer Interactions	5
Programming of Mobile Applications for Android Programming of Mobile Applications for iOS (in the Swift language)	5
Entrepreneurship and Ethics Principles of Economics	5
Industrial Practice (in Informatics)	5
Big Data Management Cloud and Grid Technologies (CEN) Blockchain and Its Applications (INF) Big Data Storage and Processing Systems	5
Industrial Practice (in Informatics)	5
Courses from elective concentrations 1–8	20

Big Data Management Cloud and Grid Technologies (CEN) Blockchain and Its Applications (INF) Big Data Storage and Processing Systems	5
Course from elective concentrations 1–8	10
Elective Free Component 1	5
Elective Free Component 2	5
Elective Free Component 3	5
Elective Free Component 4	5
TOTAL	**240**

Concentration 1

Subject	Credits
Design of Information Systems	6
Information Security of Information Systems	4
Information Systems for the Management of Business Processes	5
Information Systems of Business Analysis (INF)	5
Bachelor’s Project (INF)	10

Concentration 2

Subject	Credits
Probabilistic Models in Decision Making Statistical Models in Decision Making Information Models in Decision Making Game Theory in Decision Making Cryptosystems in Information Security	6
Coding and Encryption in Information Security (INF) Information Security of Information Systems Analytical Services in Databases	4
Information Systems of Business Analysis (INF) Computer Simulation	5
Programming of Decision-Making Tasks in Python	5
Bachelor’s Project (INF)	10

Concentration 3

Subject	Credits
Embedded Systems (INF)	5
Design of SCADA Systems	6
Modernisation and Servicing of Computer Systems	4
Organisation of Communication Networks	5
Bachelor’s Project (INF)	10

Concentration 4

Subject	Credits
Organisation of Communication Networks	5
Design of Data Processing Centres Automation of Industrial Technological Processes	6
Information Security of Information Technologies	4
Elective: Mobile Technologies Modernisation and Servicing of Computer Systems (INF) SCADA Systems Robotics	5
Bachelor’s Project (INF)	10

Concentration 5

Subject	Credits
Web Development	6
Electronic Commerce Mobile Technologies	5
Information Security of Information Systems	4
Development of the Server Web Interface Using the ASP.NET Framework	5
Bachelor’s Project (INF)	10

Concentration 6

Subject	Credits
Organisation of Communication Networks	5
Design of Network Multimedia Systems	6
Information Security of Information Technologies	4
Computer Games Mobile Technologies	5
Bachelor’s Project (INF)	10

Concentration 7

Subject	Credits
Development of an Organisational Content Management System PHP/MySQL Web Programming Technology	5
Development of Software Products	6
Information Security of Software Systems	4
Technologies of Design and Analysis of Software Systems (CASE, Agile) Models and Software Implementation of Automated Control Tasks	5

Bachelor’s Project (INF)	10

Concentration 8

Subject	Credits
Robotics	5
Deep Learning	6
Artificial Intelligence and Information Security	4
Solving Artificial Intelligence Tasks in Python	5
Bachelor’s Project (INF)	10