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**Curriculum**

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| **Program** | | Bachelor degree program – **Computer Science** | |
| **Degree awarded** | | **Bachelor of Informatics** | |
| **Faculty** | | **Faculty of Exact and Natural Sciences** | |
| **Program coordinator/coordinators** | | **Professor Akaki Girgvliani** | |
| **Length of the program (semester, ECTS)** | | **4 years / 8 semesters / 240 credits**  Basic (Major) Programme – 180 cr.  Minor Program/Free credits – 60 cr. | |
| **Language of the Program** | | | **Georgian** |
| **Program development and renewal date of issue** | | | Faculty of Exact and Natural Sciences Board protocol №7; 25.04.2011  Academic Board protocol №1 (11/12) 31.08.2011;  The Accreditation Decision #49, 23.09.2011  Faculty Board Protocol #8, 24.05.2012  Academic Board protocol #17, 25.05.2012  IT Department Meeting Protocol #5, 22.01.2014  IT Department Meeting Protocol #7, 16.05.2014  Faculty Board Protocol #3, 16.05.2014  Faculty Board Protocol #12, 15.06.2016  Academic Board protocol #2, (15/16) 22.09.2016  Faculty Board Protocol #1, 11.09.2017  Academic Board protocol #1 (17/18) 15.09.2017 |
| **Program prerequisites** | | | |
| **-** Certificate of general education;  **-**  Certificate of confirmation of passing the unified national exams;  For International Students/ non-citizens of Georgia  – secondary or equivalent education in a foreign country; certificate of confirmation of passing the unified national exams;  - Certificate recognized under inter-country agreement | | | |
| **Aim of the Program** | | | |
| * Provide knowledge for the first stage of higher education in the field of Computer Science; * Assist to develop computer skills to deal with theoretical and practical issues; * Assist to develop skills for Logical thinking, critical thinking and analysis, and proper data inference ; * Assist to develop skills for written and oral communication with professionals and non-professionals; * Assist to develop skills for organization of studies;   Provide with professional ethics and values. | | | |
| **Learning outcomes (the map of competences - see attached document 2)** | | | |
| **Knowledge and understanding** | ***General/transferable competences***   * Basic competencies of the programme; * Knowledge of basic methods of constructing computer systems and LAN * Knowledge of basic computer hardware and its features; * Knowledge of computer software and its features;   ***Branch competences:***   * Determination of the types of operational systems and microcomputer operating system * Competence in basic programming methodology; * Competence in basic object-oriented programming methodology * Competence in algorithms and data structures; * Competence in data processing features in *Access* * Competence in the principles of operating system organization and composition; * Competence in principles for functioning of certain elements and knots of computer system; * Knowledge of some aspects of the history of informatics and its impact on the scientific thinking;   Foreign language competence to refer to the literature in Computer Technologies. | | |
| **Applying knowledge** | ***General/transferable competences***   * General skills of working on the PC * Ability to construct batabase structure * Ability of appling programming methods to deal with different practical problems;   ***Branch competences:***   * LAN planning, selecting and editing skills; * Ability of constructing and using of computer security system. | | |
| **Making judgement** | After the completion of the program, the graduate will have:   * Ability of Abstract thinking, analyzing and synthesizing * Ability of the realization of tasks on the computer and analyzing the outcomes; * Ability of problem identification, statement and resolution; * Ability of meaningful decision-making. | | |
| **Communication skills** | * Communicating through discussions and conclusions clearly and accurately to the adresee orally and in wrting; * Adapting to the group; * Applying information and communication technologies to properly search, work on and present information in different resources; * Stating ideas clearly and accurately; * Communicating in professional language; * Working individually and in a team. | | |
| **Learning skills** | * Ability to work independently; * Ability to manage time. | | |
| **Values** | * Ability of critical thinking and self-criticism; * Ability to realize responsibility; * Ability to take group-responsibility; * Ability to avoid mistake recurrence. | | |
| **Teaching methods** | | | |
| From traditional teaching methodology we offer:  Induction, deduction, analysis, and synthesis; verbal and explanatory, writing, heuristic and demonstrative;  Also:  Case-technologies: method of situational analysis, situational tasks and problems, and case-study;  Action-oriented learning and etc. | | | |
| **Structure of the Program** | | | |
| The program covers 180 credits of major and 60 credits of minor courses equaling a total of 240 credit hours. Major course combines: compulsory university courses (15 credits), compulsory faculty courses (20 credits), elective compulsory faculty modes (5 credits), compulsory courses of specialization (115 credits) and elective modules of specialization (25 credits).  **See Appendix 1.** | | | |
| **Assessment System** | | | |
| Final assessment of a student is obtained from the add-up of mid-term and final exams throughout the semester. The educational course has a grading scale of 100 points. The student has the right to take the final exam, if his/her minimum competency equals 18 points.Minimum margin of assessment received by the student on the final exam is 15 points. Below than this, is assessed with FX (fail).  Evaluation System includes:  A. Five Forms of Positive Assessment:  (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  B. Two Forms of Negative Assessment:  (FX) (Administrative Fail in Course for Grade/could not pass) – A student gets 41-50 points from maximum evaluation which means that s/he is required to work more for passing the exam, and that s/he is entitled to take a make-up exam only once through personal study  (F) (Academic Fail) – A student gets 0 – 40 points from maximum evaluation; it means that the work done by him/her is not sufficient and she/he has to retake the course.  According to educational component of educational program, in case of adoption of FX, a makeup exam will be appointed no less than 5 calendar days after the conclusion of the final exam results.  The number of points received in the make-up final exam, is not added to the final assessment received by the student.  According to the assessment 0-50 points received from the make-up final exam, in the final evaluation of the educational component, the student will receive a grade of F-0.  (Midterm and final exams take place in exam center of ATSU)  Specific assessment criteria are outlined in the syllabus of any academic course. | | | |
| **Employment opportunities** | | | |
| Areas of professional activities for the graduates are practically unlimited as Information Technologies play leading role in almost all spheres of social life and this role increases day by day.  The role of IT is especially important in science, education, economy, communications, transport, production and others.  In addition, the one who completes this program can apply to graduate courses in Computer Science as well as to multiple interdisciplinary graduate programmes. | | | |
| **Supportive resources** | | | |
| See Addendixes 2.1-2.42 | | | |
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**Curriculum 2017-2021**

**Programme: Computer Science**

**Qualification: Bachelor of Informatics**

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| № | Course | Contact hrs. per week | Credit Number | The number of hours | | | | Lectures/practical/group work/laboratory | Semester | | | | | | | | Precondition |
| Total | Contact | | Independent | I | II | III | IV | V | VI | VII | VIII |
| Auditory | Midterm and final exam |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 | **University Compulsory (15 ECTS)** | | | | | | | | | | | | | | | | |
| 1.1 | Foreign Language-1 | 4 | 5 | 125 | 60 | 3 | 62 | 0/3/0/0 | 5 |  |  |  |  |  |  |  |  |
| 1.2 | Foreign Language -2 | 4 | 5 | 125 | 60 | 3 | 62 | 0/3/0/0 |  | 5 |  |  |  |  |  |  | 1.1 |
| 1.3 | Foreign Language -3 | 4 | 5 | 125 | 60 | 3 | 62 | 0/3/0/0 |  |  | 5 |  |  |  |  |  | 1.2 |
| **Total:** | |  | **15** | **375** | **180** | **9** | **186** | **-** |  |  |  |  |  |  |  |  |  |
| 2 | **Faculty Compulsory Courses (20 ECTS – 4 courses)** | | | | | | | | | | | | | | | | |
| 2.1 | Computer Skills | 4 | 5 | 125 | 60 | 3 | 62 | 2/0/2/0 | 5 |  |  |  |  |  |  |  | - |
| 2.2 | Math Analysis -1 | 4 | 5 | 125 | 60 | 3 | 62 | 2/2/0/0 | 5 |  |  |  |  |  |  |  | - |
| 2.3 | Linear Algebra and Analytical Geometry - 1 | 3 | 5 | 125 | 45 | 3 | 77 | 2/1/0/0 | 5 |  |  |  |  |  |  |  | - |
| 2.4 | Programming Basics | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 | 5 |  |  |  |  |  |  |  | - |
| **Total:** | |  | **20** | **500** | **210** | **12** | **278** | **-** |  |  |  |  |  |  |  |  |  |
| 3 | **Faculty Elective Courses (5 ECTS 1 course)**  **Note.** A student elects one of the 3.1-3.4 courses | | | | | | | | | | | | | | | | |
| 3.1 | Introduction to Physics | 3 | 5 | 125 | 45 | 3 | 77 | 2/1/0/0 | 5 |  |  |  |  |  |  |  | - |
| 3.2 | Introduction to Chemistry | 3 | 5 | 125 | 45 | 3 | 77 | 2/0/1/0 |  |  |  |  |  |  |  |  | - |
| 3.3 | Introduction to Biology | 3 | 5 | 125 | 45 | 3 | 77 | 2/1/0/0 |  |  |  |  |  |  |  |  | - |
| 3.4 | Introduction to Geography | 3 | 5 | 125 | 45 | 3 | 77 | 2/1/0/0 |  |  |  |  |  |  |  |  | - |
| **Total:** | |  | **5** | **125** | **45** | **3** | **77** | **-** |  |  |  |  |  |  |  |  |  |
| 4 | **Specialization Compulsory Courses (115 ECTS)** | | | | | | | | | | | | | | | | |
| 4.1 | Programming | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  | 5 |  |  |  |  |  |  | 2.4 |
| 4.2 | Object Oriented Programming 1 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  | 5 |  |  |  |  |  | 4.1 |
| 4.3 | Object Oriented Programming 2 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  | 5 |  |  |  |  | 4.2 |
| 4.4 | Math Analysis 2 | 3 | 5 | 125 | 45 | 3 | 77 | 2/1/0/0 |  | 5 |  |  |  |  |  |  | 2.2 |
| 4.5 | Linear Algebra and Analytical Geometry 2 | 3 | 5 | 125 | 45 | 3 | 77 | 1/2/0/0 |  | 5 |  |  |  |  |  |  | 2.3 |
| 4.6 | Discrete Mathematics | 3 | 5 | 125 | 45 | 3 | 77 | 2/1/0/0 |  |  | 5 |  |  |  |  |  | 4.5 |
| 4.7 | Numerical Methods | 3 | 5 | 125 | 45 | 3 | 77 | 2/1/0/0 |  |  |  | 5 |  |  |  |  | 4.4 |
| 4.8 | Probability Theory and Math Statistics | 3 | 5 | 125 | 45 | 3 | 77 | 1/2/0/0 |  |  |  | 5 |  |  |  |  | 4.4 |
| 4.9 | Math Programming | 3 | 5 | 125 | 45 | 3 | 77 | 1/2/0/0 |  |  |  |  | 5 |  |  |  | 4.5 |
| 4.10 | Informatics | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  | 5 |  |  |  |  |  |  | - |
| 4.11 | Algorithms and Data Structure 1 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  | 5 |  |  |  |  |  |  | 2.4 |
| 4.12 | Algorithms and Data Structure 2 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  | 5 |  |  |  |  |  | 4.11 |
| 4.13 | World Information Resources | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  | 5 |  |  |  |  | 4.10 |
| 4.14 | Data Base 1 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  | 5 |  |  |  | 4.10 |
| 4.15 | Data Base 2 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  | 5 |  |  | 4.14 |
| 4.16 | Management Theory | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  | 5 |  |  |  | 4.4 |
| 4.17 | Computer Systems and Networks 1 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  | 5 |  |  | 4.10 |
| 4.18 | Computer Systems and Networks 2 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  | 5 |  | 4.17 |
| 4.19 | Operating Systems | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  | 5 |  | 4.10 |
| 4.20 | Information Security and Defense | 3 | 5 | 125 | 45 | 3 | 77 | 2/0/1/0 |  |  |  |  |  |  |  | 5 | 4.18 |
| 4.21 | Web-Programming | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  |  | 5 | 4.13 |
| 4.22 | Computer Graphics and Multimedia Systems | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  |  | 5 | 4.10 |
| 4.23 | Computer Organization and Functioning | 3 | 5 | 125 | 45 | 3 | 77 | 2/0/1/0 |  |  |  |  |  |  | 5 |  | 4.10 |
| **Total:** | | **-** | **115** | **2875** | **1035** | **69** | **1771** | **-** |  | | | | | | | | |
| **5-8** | **Specialization Elective Modules (25 ECTS)** | | | | | | | | | | | | | | | | |
| **5** | **Elective Module - 1** | | | | | | | | | | | | | | | | |
| 5.1 | Visual Programming | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  | 5 |  |  |  | 4.3 |
| 5.2 | Information Technologies | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  | 5 |  |  | 4.13 |
| 5.3 | Theory of Computational Processes and Structures | 3 | 5 | 125 | 45 | 3 | 77 | 2/0/1/0 |  |  |  |  |  | 5 |  |  | 4.12 |
| 5.4 | Software Process Technology | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  | 5 |  | 5.1 |
| 5.5 | IQ Systems | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  |  | 5 | 4.10 |
| **6** | **Elective Module – 2** | | | | | | | | | | | | | | | | |
| 6.1 | Visual Programming | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  | 5 |  |  |  | 4.3 |
| 6.2 | Information Technologies | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  | 5 |  |  | 4.13 |
| 6.3 | Optimal Operation of Systems | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  | 5 |  |  | 4.16 |
| 6.4 | Basics of Microcontroller Programming | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  | 5 |  | 4.10 |
| 6.5 | Microcontroller Operating Systems | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  |  | 5 | 6.4 |
| **7** | **Elective Module – 3** | | | | | | | | | | | | | | | | |
| 7.1 | Visual Programming | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  | 5 |  |  |  | 4.3 |
| 7.2 | Information Technologies | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  | 5 |  |  | 4.13 |
| 7.3 | Theory and Design of Economic Information System | 3 | 5 | 125 | 45 | 3 | 77 | 2/0/1/0 |  |  |  |  |  | 5 |  |  | 4.10 |
| 7.4 | Electronic Commerce | 3 | 5 | 125 | 45 | 3 | 77 | 2/0/1/0 |  |  |  |  |  |  | 5 |  | 7.2 |
| 7.5 | Accounting Software | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  |  | 5 | 4.15 |
| **8** | **Elective Module – 4** | | | | | | | | | | | | | | | | |
| 8.1 | Basics of Digital Systems 1 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  | 5 |  |  |  | 4.6 |
| 8.2 | Basics of Digital Systems 2 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  | 5 |  |  | 8.1 |
| 8.3 | Architecture of Digital Systems1 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  | 5 |  |  | 8.1 |
| 8.4 | Architecture of Digital Systems2 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  | 5 |  | 8.3 |
| 8.5 | Architecture of Digital Systems3 | 3 | 5 | 125 | 45 | 3 | 77 | 1/0/2/0 |  |  |  |  |  |  |  | 5 | 8.4 |
| **Total:** | |  | **25** | **625** | **225** | **15** | **385** | **-** |  |  |  |  |  |  |  |  |  |
| **Overall Total:** | |  | **180** | **4500** | **1620** | **108** | **2772** | **-** |  | | | | | | | | |
|  | **Minor Modules** |  | **60** |  |  |  |  |  |  |  | **10** | **10** | **10** | **10** | **10** | **10** |  |

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|  | | **Program Components** |  |  |  |  |  |  |  |  |  |  |  |  |
| University Compulsory Course (Foreign Language) | | | | | 5 | 5 | 5 |  |  |  |  |  | 15 |
| Faculty Courses | | | Compulsory | | 20 |  |  |  |  |  |  |  | 20 |
| Elective | | 5 |  |  |  |  |  |  |  | 5 |
| Specialization Courses | | | Compulsory | |  | 25 | 15 | 20 | 20 | 10 | 15 | 15 | 115 |
| Elective | |  |  |  |  | 5 | 10 | 5 | 5 | 25 |
| ***Note:*** *Academic degree is awarded to a student after passing Minor or Teacher training education Program together with Major Program. Students of the Faculty of Exact and Natural Sciences are offered Minor programs in Mathematics, Physics, Chemistry, Biology, Ecology, Applied Biosciences, Geography, Business Management, Economics, and Tourism. These programs are introduced in 3 – 8 semesters with 10 credit scale each.* | | | | | | | | | | | | | |
| Minor Credits | | | | |  |  | 10 | 10 | 10 | 10 | 10 | 10 | 60 |
| Total | | | | | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 240 |
|  | |  |  |  |  |  |  |  |  |  |  |  |  |  |
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