3. Educational programme

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1. Profile of the Educational Programme " Cybersecurity and Information Protection" in the Subject Area F5 "Cybersecurity and Information Protection"

1- GENERAL INFORMATION	
Full name of a HEI and a structural unit	State University of Trade and Economics Faculty of Information Technologies Department of Software Engineering and Cybersecurity
Higher Education Level and title of qualification in the original language	First (Bachelor's) cycle of higher education Qualification – Bachelor's degree in "Cybersecurity and information protection"
Field of Knowledge	F "Information technology"
Subject Area	F5"Cybersecurity and Information Protection"
Educational Programme Official Name	"Cybersecurity and Information Protection"
Restrictions on Modes of Study	No restrictions
Compliance with the Higher Education Standard of the Ministry of Education and Culture of Ukraine	Complies with the Higher Education Standard of the Ministry of Education and Science of Ukraine (Order No. 1547 of 29.10.2024)
Diploma Type and the Educational Programme Volume	Bachelor's Degree Diploma, single, 240 ECTS credits, training period: 3 years and 10 months.
Accreditation Availability	Certificate of accreditation of the speciality No. 4668, valid until 01.07.2027, issued by the National Agency for Higher Education Quality Assurance.
Higher Education Cycle/Level	NQF of Ukraine – Level 6, FQ-EHEA – First cycle, EQF-LLL – Level 6.
Prerequisites for Admission to the Educational Programme	Complete secondary education, initial level of higher education
Language(s) of Training	Ukrainian
Term of validity of the educational program	Until the approval of the new edition of the educational programme
Internet Address for Permanent Placement of the Educational Programme Description	https://knute.edu.ua/

2 – THE PURPOSE OF THE EDUCATIONAL PROGRAMME

Formation of a modern system of professional knowledge and skills in the field of security of information and communication systems of the enterprise (organization), *particular in the economy*. Formation of a person capable on the basis of acquired integrated, general and professional competencies to work successfully in the field of IT technologies, ensuring the security of information and communication systems of the enterprise (organization), *particular in the economy.*

3 –EDUCATIONAL PROGRAMME CHARACTERISTICS

Subject area

Objects of study and activity:

- cybersecurity and information protection technologies;
- cybersecurity and information protection management processes; objects of information activity, including information and information and communication systems, information resources and technologies.

Learning objectives:

training of specialists capable of using and implementing cybersecurity and information protection technologies and solving complex tasks in the field of cybersecurity and information protection.

Theoretical content

Principles, concepts, theories of protection of vital interests of an individual, society, and the state in the use of cyberspace, which ensures the sustainable development of the information society and digital communication environment, timely detection, prevention and neutralisation of real and potential threats to Ukraine's national security in cyberspace.

Methods, techniques, and technologies methods, techniques and technologies for solving theoretical and practical problems of cybersecurity and information protection.

Tools: tools, devices, network equipment, application and specialised software, information systems and complexes for designing, modelling, controlling, monitoring, storing, processing, displaying and protecting data (information flows).

Educational Programme Orientation

Educational and Professional

Main Focus of the Educational Programme

Special education in the field of knowledge "Information Technology", subject area "Cybersecurity and Information Protection". Ability to organise and maintain a set of measures to ensure the security of information systems and networks of the enterprise (organisation), taking into account their legal and economic feasibility, technical implementation, prevention of possible external influences, possible threats and the use of information security technologies.

Keywords: security of information and telecommunication systems; cryptographic methods of information protection; number theory; security of operating systems and networks.

Educational Programme Features

The programme creates the following chain: tasks, knowledge, skills, abilities, professional activity, professional context, work area, interests, professional styles, professional values, related professions, and salary. The modular principle is used to

reveal the essence of these components.
Integration of software and hardware tools for detecting, monitoring and ensuring IS, information security technologies in enterprise information and communication systems, in particular in the economy, data storage technologies in a single information space and the implementation of cybercrime counteraction functions.

4 – EMPLOYABILITY AND FURTHER EDUCATION OPPORTUNITIES FOR GRADUATES

Employability

For positions in the structural units of enterprises / organisations that require higher education in the speciality F5 Cybersecurity and Information Protection.
Graduates of this educational and professional programme can hold primary positions (according to the Classification of Occupations of Ukraine DK 003:2010):
The specialist is able to perform professional work and hold positions defined by the National Classifier of Ukraine "Classifier of professions DK 003:2010":
2139.2 Cybersecurity infrastructure support specialist
2139.2 Specialist in technical protection of information
2139.2 Cybersecurity incident response specialist
2139.2 Cybersecurity infrastructure support specialist
2139.2 Specialist in cryptographic information protection
2359.2 Instructor-methodologist in information security

Further Education Opportunities

Obtaining a degree at the second (master's) cycle of higher education. Acquiring additional qualifications in the postgraduate education system.

5-TEACHING AND ASSESSMENT

Teaching and Learning

A balanced combination of classroom classes (lectures, discussions, seminars, small group workshops, independent work with information sources, and teacher consultations), distance learning, and independent work based on problem-based, interactive learning and self-study.

Assessment

The assessment of students' learning outcomes is carried out by the ‘Regulations on the assessment of students' and postgraduate students' learning outcomes at SUTE and involves the following control measures: ongoing and final assessments, and attestation.
Ongoing assessment is carried out during practical/laboratory classes and based on the results of individual assignments. It involves assessing students' theoretical knowledge during seminars and the practical skills they have acquired while performing laboratory/practical tasks.
Final assessment consists of control measures that determine the compliance (measurement, evaluation) of the learning outcomes achieved by a person with the requirements of the educational programme in terms of the relevant educational component, which is carried out at the university in the form of a credit and an exam.
The learning outcomes of students at SUTE are assessed on a 100-point scale, where: 60-100 points – learning outcomes that entitle the student to obtain ECTS credits; 0-59 points – unsatisfactory learning outcomes that do not entitle the student to obtain ECTS credits.

6-PROGRAMME COMPETENCIES	
Integral competence	
Ability to solve complex specialised problems and practical tasks in the field of cybersecurity and information protection	
General competencies (GC)	
GC01	Ability to apply knowledge in practical situations.
GC02	Knowledge and understanding of the subject area and understanding of the profession.
GC03	Ability to communicate in the state language both orally and in writing.
GC04	Ability to communicate in a foreign language.
GC05	Ability to learn and master modern knowledge.
GC06	Ability to exercise their rights and responsibilities as a member of society, to understand the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine.
GC07	Ability to make decisions and act in accordance with the principle of inadmissibility of corruption and any other manifestations of dishonesty.
GC08	Ability to preserve and enhance moral, cultural, scientific values and achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technology, to use various types and forms of physical activity for active recreation and healthy lifestyle.
GC09	*Basic knowledge of fundamentals of economics and business.*
Special (professional, subject-specific) competencies (SC)	
SC01	Ability to apply the legislative and regulatory framework, as well as national and international requirements, practices and standards in professional activities.
SC02	Ability to use information technology, modern methods and models of cybersecurity and information security systems.
SC03	Ability to ensure the continuity of business processes in accordance with the established cybersecurity and information protection policy.
SC04	Ability to ensure the protection of information in information and information and communication systems in accordance with the established cybersecurity and information protection policy.
SC05	Ability to restore the functioning of information and information and communication systems AFTER threats, cyber attacks, failures and failures of various classes and origin.
SC06	Ability to implement and ensure the functioning of integrated information security systems (complexes of regulatory, organisational and technical means and methods, procedures, practices, etc.)
SC07	Ability to carry out professional activities based on the implemented information and cybersecurity management system.
SC08	Ability to apply methods and means of cryptographic protection of information at the objects of information activity.

SC09	Ability to apply methods and means of technical protection of information at the objects of information activity.
SC10	Ability to monitor information processes, analyse, identify, assess possible vulnerabilities and threats to the information space and information resources in accordance with the established information security policy.
SC11	*Ability to conduct technical and economic analysis and justify design solutions to ensure cybersecurity.*
SC12	*Ability to manage information and cybersecurity risks.*
7-PROGRAMME LEARNING OUTCOMES	
PLO01	To communicate fluently in the state language orally and in writing in the performance of professional duties.
PLO02	To communicate in a foreign language to ensure the effectiveness of professional communication.
PLO03	To apply the principle of inadmissibility of corruption and any other manifestations of dishonesty in professional activities.
PLO04	To organise own professional activity, choose and use optimal methods and ways of solving complex specialised tasks and practical problems in professional activity, evaluate their effectiveness.
PLO05	To analyse, argue, make decisions in solving complex specialised tasks and practical problems in professional activities characterised by complexity and incomplete certainty of conditions, be responsible for decisions made.
PLO06	To adapt to new conditions and technologies of professional activity, predict the final result
PLO07	To apply and adapt theories of information and coding, mathematical statistics, numbers, cryptography and steganography, signal processing and transmission, etc., principles, methods, concepts of cybersecurity and information protection in education and professional activities.
PLO08	To apply the knowledge and understanding of mathematics and physics in professional activities, formalise the tasks of the subject area of cybersecurity and information protection, formulate their mathematical formulation and choose a rational method of solution.
PLO09	To know and apply the legislation of Ukraine and international requirements, practices and standards in order to carry out professional activities in the field of cybersecurity and information protection.
PLO10	To use modern information technologies, methods and models of cybersecurity and information protection systems to carry out professional activities.
PLO11	To plan the preparation and ensure the continuity of business processes in organisations in accordance with the established cybersecurity policy, taking into account the requirements for information protection.
PLO12	To apply methods and means of information protection in information and information and communication systems in accordance with the established information security policy.
PLO13	To implement, configure, maintain and support the functioning of software and hardware complexes and cybersecurity and information protection systems as necessary procedures for the functioning of information and

	information and communication systems and/or the organisation's infrastructure as a whole.
PLO14	To solve the tasks of managing the processes of restoring the normal functioning of information and information and communication systems using backup procedures in accordance with the established security policy and ensure the functioning of special software for information protection and recovery.
PLO15	To collect, process, store, and analyse critical data to prove the implementation of cyber threats, and analyse and investigate cyber incidents to promptly restore the functioning of the information system.
PLO16	To solve the tasks of implementing and maintaining integrated information security systems in information systems.
PLO17	To ensure the functioning of the organisation's cybersecurity and information protection management system, including personnel and management of the consequences of information security threats in crisis situations, based on the implementation of quantitative and qualitative risk assessment procedures.
PLO18	To analyse and apply methods and means of cryptographic protection of information at the objects of information activity.
PLO19	To solve problems of organising and monitoring the state of cryptographic information protection, in particular in accordance with the requirements of regulatory documents.
PLO20	To identify threats of creating technical channels of information leakage at information activity objects; implement means and measures of technical protection of information from leakage through technical channels, maintain and control the state of information protection hardware and technical information protection complexes.
PLO21	To implement, maintain, and analyse the effectiveness of systems for detecting unauthorised access, actions with information in the information system, vulnerabilities, and possible threats to the information space and information resources, and use protection systems to ensure the required level of information security in information systems
PLO22	*To analyse the cost-effectiveness of information security measures.*
PLO23	*To apply knowledge of methods of technical and economic analysis and justification of design decisions*
8- RESOURCE SUPPORT FOR PROGRAMME IMPLEMENTATION	
Staffing	
Fully complies with the licensing requirements for educational activities. The educational and professional programme “Cybersecurity and information protection’ is implemented by academic staff with scientific degrees and/or academic titles who meet the requirements of the current legislation of Ukraine and have a sufficient level of scientific and professional qualifications. Practitioners, representatives of professional associations and foreign partners are also involved in the educational process. All academic staff undergo training/professional development every five years.	
Material and technical support	
Fully complies with the Licensing Requirements for Educational Activities. For the convenience of higher education students, there is a corporate distance learning system	

and an automated educational process management system called 'MIA: Education'. The university has modern computer classrooms with specialised software and a Smart Library. All conditions for the education of persons with disabilities have been created. SUTE social infrastructure is available.

Information and educational-methodological support

An ECTS Information Package is developed for each educational programme at the university. Each student can view and create his/her individual plan, view the curriculum, grades obtained in disciplines, class schedule, and communicate with participants in the educational process through a personal account in the MIA: Education automated information system.

Course summaries, course outlines, syllabi and assessment criteria for educational components are posted on the corporate distance learning platform.

The university's electronic repository provides full-text access to SUTE scientific and educational literature, manuscripts of qualification works and theses for obtaining academic degrees.

For the convenience of higher education students, the university has developed a Catalogue of Academic Disciplines, according to which students have the right to choose elective educational components.

9-ACADEMIC MOBILITY

National credit mobility

National credit mobility is implemented within the framework of memoranda of cooperation concluded between SUTE and other higher education institutions (research institutions) in Ukraine under the law.

International credit mobility

The University has signed cooperation agreements between SUTE and foreign higher education institutions, within the framework of which partnership exchanges and student training are carried out under international programmes and projects within the Erasmus+ programme.

Organisation of credit mobility (except for the 1st year) for bachelors. mobility agreement between DTeU and the Slovak University of Technology (Bratislava):

Erasmus+ Learning Agreement Student Mobility for Studies International Mobility (KA171)

The academic mobility agreement is valid from 2024 to 2027.

Foreign Higher Education Students Training

It is carried out under the requirements of current legislation.

2. LIST OF COMPONENTS OF THE EDUCATIONAL PROGRAMME AND THEIR LOGICAL SEQUENCE

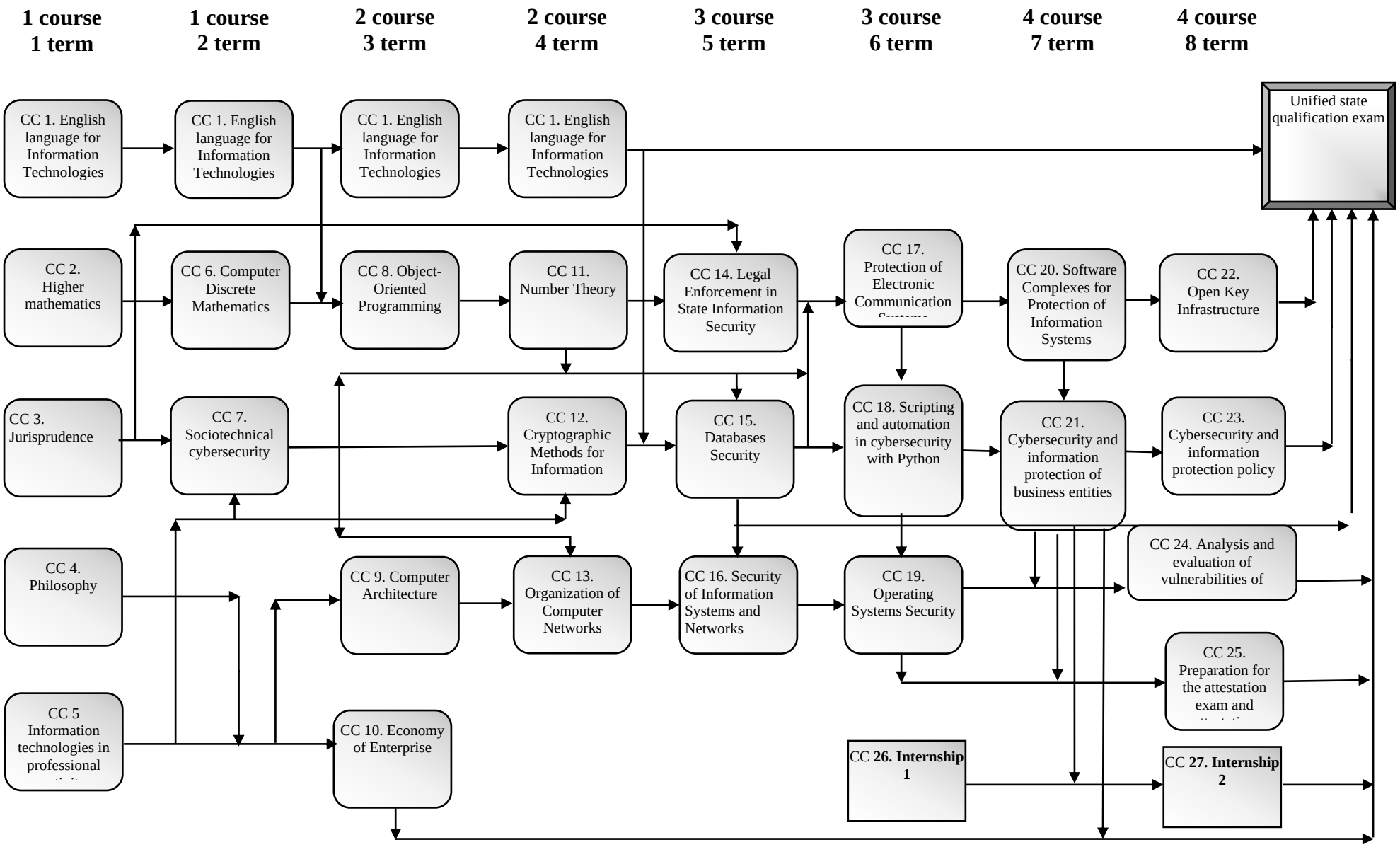
2.1.List of EP components

Code	Educational programme components	ECTS credits	Form of control
EP Compulsory components			
CC 1.	English language for Information Technologies	24	Exam
CC 2.	Higher Mathematics	6	Exam
CC 3.	Jurisprudence	6	Exam
CC 4.	Philosophy	6	Exam
CC 5.	Information Technologies in Professional Activity	6	Exam
CC 6.	Computer Discrete Mathematics	6	Exam
CC 7.	Socio-Technical Cybersecurity	6	Exam
CC 8.	Object-Oriented Programmeming	6	Exam
CC 9.	Computer Architecture	6	Exam
CC 10.	Economy of Enterprise	6	Exam
CC 11.	Number Theory	6	Exam
CC 12.	Cryptographic Methods for Information Security	6	Exam
CC13	Organisation of Computer Networks	6	Exam
CC 14.	Legal Enforcement in State Information Security	6	Exam
CC 15.	Databases Security	6	Exam
CC 16.	Security of Information Systems and Networks	6	Exam
CC17	Protection of Electronic Communication Systems	6	Exam
CC 18.	Scripting and Automation in Cybersecurity with Python	6	Exam
CC 19.	Operating Systems Security	6	Exam
CC 20.	Software Complexes for Protection of Information Systems	6	Exam
CC 21.	Cybersecurity and Information Protection of Business Entities	6	Exam
CC 22.	Open Key Infrastructure	6	Exam
CC 23.	Cybersecurity and Information Protection Policy	6	Exam
CC 24.	Analysis and Evaluation of Vulnerabilities of Information Systems	6	Exam
CC25.	Preparation for the Attestation Exam and Attestation	6	Exam
CC26.	Internship 1	6	Credit
CC27.	Internship 2	6	Credit
Total Volume of Compulsory Components		**180**	
EP Elective Components			

EC1	Educational Component 1	6	Exam
EC2	Educational Component 2	6	Exam
EC3	Educational Component 3	6	Exam
EC4	Educational Component 4	6	Exam
EC5	Educational Component 5	6	Exam
EC6	Educational Component 6	6	Exam
EC7	Educational Component 7	6	Exam
EC8	Educational Component 8	6	Exam
EC9	Educational Component 9	6	Exam
EC10	Educational Component 10	6	Exam
Total Volume of Elective Components		**60**	
THE EDUCATIONAL PROGRAMME TOTAL VOLUME		**240**	

Higher education students choose their elective disciplines through the personal account of the portal "MIA: Education". Descriptions of the disciplines and their prerequisites are available in the SUTE Catalogue of Disciplines.

2.2 Structural and logical scheme of EP



3. FORMS OF ATTESTATION OF HIGHER EDUCATION STUDENTS

The attestation of bachelor's degree students in Cybersecurity and information protection is carried out in the form of an attestation exam.

The attestation exam in the subject area tests the achievement of learning outcomes defined by the Higher Education Standard and the educational programme.

4. MATRIX OF CORRESPONDENCE BETWEEN PROGRAM COMPETENCIES AND COMPULSORY COMPONENTS OF THE EDUCATIONAL PROGRAMME

Components/ Competencies	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12	CC 13	CC 14	CC 15	CC 16	CC 17	CC 18	CC 19	CC 20	CC 21	CC 22	CC 23	CC 24	CC25	CC26	CC27
GC01		+									+	+					+								+	+	+
GC02					+		+	+											+		+		+		+	+	+
GC03				+	+		+						+												+	+	+
GC04	+															+		+							+	+	+
GC05					+							+					+			+					+	+	+
GC06			+		+									+							+				+	+	+
GC07			+	+										+							+				+	+	+
GC08				+			+	+								+			+						+	+	+
GC09			+							+				+							+				+	+	+
GC10			+											+											+	+	+
GC11					+								+						+		+		+	+	+	+	+
GC12										+								+					+		+	+	+
GC13					+		+	+	+			+				+	+				+	+			+	+	+
GC14		+		+				+		+					+	+	+					+	+	+	+	+	+
GC15	+					+				+										+			+		+	+	+
SC01	+		+	+			+		+							+		+	+				+		+	+	+
SC02		+			+					+	+	+								+			+	+	+	+	+
SC03	+					+	+					+								+					+	+	+
SC04	+				+		+						+							+	+		+	+	+	+	+
SC05							+			+										+			+		+	+	+
SC06					+					+											+				+	+	+
SC07		+									+	+					+								+	+	+
SC08					+		+	+											+		+		+		+	+	+
SC09				+	+		+						+												+	+	+
SC10	+															+		+							+	+	+
SC11					+							+					+			+					+	+	+
SC12			+		+									+							+				+	+	+

5. MATRIX OF CORRELATION BETWEEN PROGRAM LEARNING OUTCOMES AND COMPULSORY COMPONENTS OF THE EDUCATIONAL PROGRAMME

Components / Programme Learning Outcomes	CC 1	CC 2	CC 3	CC 4	CC 5	CC 6	CC 7	CC 8	CC 9	CC 10	CC 11	CC 12	CC 13	CC 14	CC 15	CC 16	CC 17	CC 18	CC 19	CC 20	CC 21	CC 22	CC 23	CC 24	CC25	CC26	CC27
PLO01			+	+	+		+							+									+		+	+	+
PLO02	+							+										+							+	+	+
PLO03			+											+							+		+		+	+	+
PLO04					+		+						+										+		+	+	+
PLO05															+				+		+				+	+	+
PLO06					+						+														+	+	+
PLO07					+	+						+					+								+	+	+
PLO08		+				+					+										+				+	+	+
PLO09			+											+										+	+	+	+
PLO10					+								+						+		+		+	+	+	+	+
PLO11										+								+					+		+	+	+
PLO12							+					+				+	+				+				+	+	+
PLO13					+			+	+								+					+			+	+	+
PLO14				+												+	+					+	+		+	+	+
PLO15		+						+		+					+								+	+	+	+	+
PLO16	+					+				+										+			+		+	+	+
PLO17	+		+	+			+		+							+		+	+				+		+	+	+
PLO18		+									+	+								+				+	+	+	+
PLO19					+					+		+								+			+		+	+	+
PLO20	+					+	+					+								+					+	+	+
PLO21	+				+		+						+							+	+		+	+	+	+	+
PLO22										+		+									+				+	+	+
PLO23							+			+					+					+	+			+	+	+	+

Appendix

LIST OF RECOMMENDED ELECTIVE COMPONENTS

Code	Educational Components	ECTS Credits
EC 01.	WEB Design and WEB Programming	**6**
EC 02.	Architecture and Software Design	**6**
EC 03.	Life Safety	**6**
EC 04.	Expert Systems	**6**
EC 05.	Human-machine Interaction	**6**
EC 06.	Mathematical Programming	**6**
EC 07.	Software Project Management	**6**
EC 08.	Methods and Means of Data Transmission	**6**
EC 09.	Data Models and Structures	**6**
EC 10.	Fundamentals of Programming	**6**
EC 11.	Internet Programming	**6**
EC 12.	Design and Administration of Information Systems	**6**
EC 13.	Software Development and Testing Technology	**6**
EC 14.	Startup Creation Technology	**6**
EC 15.	Communication English Tailored Course	**6**