



International Information Technology University
Faculty of Computer Technology and Cybersecurity
Department of Cybersecurity

APPROVED BY

Vice-rector for academic affairs of
JSC «International Information
Technology University»

Mustafina A.K.

2024



7M06108

«Computer technology and cybersecurity»

CATALOGUE OF ELECTIVE DISCIPLINES
2024 entry year



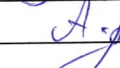

The catalogue of the elective disciplines for the educational program 7M06108 «Computer technology and cybersecurity» is developed on the basis of the Curriculum of the educational program 7M06108 «Computer technology and cybersecurity»

The catalogue of the elective disciplines was discussed at a meeting of the Cybersecurity department

Minutes No. _____ from «___» _____ 2024

Head of the Cybersecurity department _____

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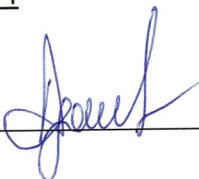
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The catalogue of the elective disciplines was approved at a meeting of the Academic Council of JSC IITU

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1 TERMS AND ABBREVIATIONS

1.1 Academic program is a single set of basic characteristics of education, including goals, results and content of training, the organization of educational process, ways and methods for their implementation and criteria for assessing learning outcomes. The content of academic program of higher education consists of three cycles of disciplines - general education disciplines (hereinafter - GED), basic disciplines (hereinafter - BD) and core disciplines (hereinafter - CD). The cycle of GED includes disciplines of the compulsory component (hereinafter - CC), the university component (hereinafter - UC) and (or) the component of choice (hereinafter - COC). BD and CD include disciplines of UC and COC.

1.2 Catalogue of elective disciplines (CED) is a systematic annotated list of all COC disciplines, for the entire training period, containing a brief description indicating the purpose of study, a summary of main sections and expected learning outcomes. CED reflects the prerequisites and postrequisites of each academic discipline. It should provide the students with the possibility of an alternative choice of elective disciplines for the formation of an individual educational trajectory.

On the basis of academic program and CED, the students develop individual curricula with the help of advisers.

1.3 Individual curriculum (IC) is a curriculum formed by the students independently with the help of an adviser for each academic year on the basis of the academic program, the catalogue of elective disciplines or modules.

IC defines an individual educational trajectory of each student separately. It includes disciplines and types of educational activities (internship, experimental research, forms of final certification) of the compulsory component (CC), the university component (UC) and the component of choice (COC).

1.4 Advisor is a teacher who performs the functions of an academic mentor of a student (according to the appropriate academic program), and assists in choosing a learning path (creating an individual curriculum) and mastering the academic program during the training period.

1.5 The university component is a list of compulsory educational disciplines determined by the university independently for the mastering of the academic program.

1.6 The component of choice is a list of academic disciplines and the corresponding minimum amounts of academic credits offered by the university and independently chosen by students in any academic period, taking into account their prerequisites and postrequisites.

1.7 Elective disciplines are educational disciplines that are a part of the university component and the component of choice in the framework of established academic credits, introduced by organizations of education reflecting the individual preparation of students and taking into account the specifics of socio-economic development, the needs of a particular region and established scientific schools.

1.8 Postrequisites are the disciplines and (or) modules and other types of academic work, the study of which requires knowledge, skills and competencies acquired at the end of the study of this discipline and (or) modules.

2 ELECTIVE DISCIPLINES

No	Cycle	Discipline code	Name of the discipline	Term	Credits	Prerequisites
1st year						
1	AS	NET7201	Cloud resource management	1	5	Introduction to Cloud
2	AS	NET7202	Virtualization technologies	1	5	Information Theory
3	AS	SEC7235	Monitoring of information exchange processes	1	5	Identity and access management
4	AS	SEC7236	Modeling of Computer Technology and Cybersecurity Processes	1	5	Mathematical foundations of information security
5	BS	SEC7208	Artificial intelligence and analytics	2	5	Organization of database management systems
6	BS	SEC7207	Neural networks	2	5	Python programming language
7	BS	SEC7210	IT process integration	2	5	Project Management in Information Security
8	BS	HRD7201	Hardware technologies for SMART systems	2	5	Smart technologies
2nd year						
9	BS	HRD7202	Internet of Things and big data analytics	3	5	Organization of database management systems
10	BS	SFT7201	Machine learning	3	5	Python programming language
11	AS	SEC7217	DevOps	3	5	Project Management in Information Security
12	AS	SFT7203	Distributed computing using blockchain	3	5	Blockchain technology

Code of discipline	SEC7236
Name of discipline	Modeling of Computer Technology and Cybersecurity Processes
Number of credits (ECTS)	5
Course, semester	1,1
Department	Cybersecurity
Prerequisites	Mathematical foundations of information security
Postrequisites	Research work of a master's student
Brief course description	In the course of studying the discipline, undergraduates will apply multiphase models of queuing and queuing networks in relation to authentication processes; disclose examples of the implementation of authentication protocols that allow them to explore all possible options for protocols and calculate their main characteristics; consider the issues of creating a model, calculating their characteristics and describes the process of creating a program in the GPSS modeling language
Expected learning outcomes	He is able to analyze various technologies and protocols of wireless networks to build their models and identify the main characteristics

Discipline description

Code of discipline	SEC7208
Name of discipline	Artificial intelligence and analytics
Number of credits (ECTS)	5
Course, semester	1,2
Department	Cybersecurity
Prerequisites	Organization of database management systems
Postrequisites	Research work of a master's student
Brief course description	During the course of studying the discipline, undergraduates will master the basics of machine learning and Python capabilities for data analysis, study the main stages and directions of research in the field of artificial intelligence systems, the basics of machine learning, the basics of Python for data analysis and processing, data-based learning
Expected learning outcomes	As a result of the training, undergraduates will have the skills to manage big data, apply machine learning algorithms, pre-process data arrays, analyze data and present results. They develop solutions based on artificial intelligence for various tasks and industries, conduct technical audits for the potential of implementing AI solutions, and train personnel in specialized programs

Discipline description

Code of discipline	SEC7207
Name of discipline	Neural networks
Number of credits (ECTS)	5
Course, semester	1,2
Department	Cybersecurity
Prerequisites	Python programming language
Postrequisites	Research work of a master's student
Brief course description	The purpose of mastering the discipline is to study the methods of neural network synthesis and their practical application

	ability of an object to send and receive data via a personal network or the Internet. The main directions of application of the Internet of Things (IoT) are described
Expected learning outcomes	Undergraduates know modern international scientific projects based on the Internet of Things (IoT) technology. They know the areas of generating, collecting, transmitting, analyzing and distributing a huge amount of data from numerous sensors of the Internet of Things and learn how to structure and analyze them

Discipline description	
Code of discipline	SFT7201
Name of discipline	Machine learning
Number of credits (ECTS)	5
Course, semester	2,3
Department	Cybersecurity
Prerequisites	Python programming language
Postrequisites	Research work of a master's student
Brief course description	During the course of studying the discipline, undergraduates will apply machine learning methods at all stages of the process from scalable clustering methods used for preprocessing the incoming file stream in the infrastructure to reliable and compact models for behavioral analysis that are created based on deep neural networks and work directly on user devices
Expected learning outcomes	Develops technologies taking into account the serious requirements for machine learning methods

Discipline description	
Code of discipline	SEC7217
Name of discipline	DevOps
Number of credits (ECTS)	5
Course, semester	2,3
Department	Cybersecurity
Prerequisites	Project Management in Information Security
Postrequisites	Research work of a master's student
Brief course description	During the course of studying the discipline, undergraduates will synchronize the stages of software product development, QA, and will automate their tasks, program and quickly learn new tools. When developing a work plan, undergraduates will be able to determine which architecture to use in the program, how exactly scaling will occur, which orchestration system is best used. Next, they will automate code verification, server configuration, and testing
Expected learning outcomes	Apply a methodology that helps automate workflows and make them seamless, which allows you to increase the speed and productivity of developers, testers and system administrators

Discipline description	
Code of discipline	SFT7203
Name of discipline	Distributed computing using blockchain
Number of credits (ECTS)	5
Course, semester	2,3