ХАЛЫҚАРАЛЫҚ УНИВЕРСИТЕТІ
МЕЖДУНАРОДНЫЙ УНИВЕРСИТЕТ
INTERNATIONAL UNIVERSITY

Faculty of Information Technology and Cybersecurity

Department of Computer Engineering and Information Security

APPROVED BY
Vice-rector for academic affairs,
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"31" 03 2021

8D06102
(Code of Academic Program)

Computer and Software Engineering
(Name of Academic Program)

CATALOGUE OF ELECTIVE DISCIPLINES

2021 entry year

2021

The catalogue of elective disciplines for the specialty/AP 8D06102 Computer and Software Engineering is developed on the basis of the working curriculum of the specialty/AP.

The catalogue of elective disciplines was discussed at a meeting of the Computer Engineering and Information Security department

minutes No. 7 from "15" 02 2021

Head of Department _____ M.T. Ipalakova

CED compiler _____ M.T. Ipalakova

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

minutes No. 4 from "30" 03 2021

Director of Institute of Postgraduate Education _____ G.U. Bektemyssova

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;

1. 9 Prerequisites are the disciplines and (or) modules and other types of educational work containing knowledge, abilities, skills and competencies necessary for the mastering of the studied discipline and (or) modules;

1. 10 Competencies are the ability of the practical use of acquired knowledge and skills in professional activities.

2 ELECTIVE DISCIPLINES

№	Cycle of discipline	Code of discipline	Name of discipline	Semester	Number of credits	Prerequisites
1 year						
1	PD	SFT8305	Model Driven Software Engineering	1	4	OOP, Software Engineering Technologies
2	PD	SFT8307	Blockchain Theory and Technology	1	4	OOP, Software Engineering Technologies
3	PD	SFT8306	Big Data Technologies and Big Systems	1	4	Data analysis methods
4	PD	SFT8310	Internet of Behaviors	1	4	OOP, Software Engineering Technologies

3 DESCRIPTION OF ELECTIVE DISCIPLINES

Description of discipline	
Code of discipline	SFT8305
Name of discipline	Model-driven Software Engineering
Number of credits (ECTS)	4
Course, semester	1, 1
Department	CE&IS
Prerequisites	OOP, Software Engineering Technologies
Postrequisites	Doctor dissertation
Brief course description	The study of a new modern approach to software development - model-driven architecture.
Expected learning outcomes	After successful completion of the course students will be able to: – explain advantages and disadvantages of traditional software lifecycle and that of MDA and differences between them; – reason about artifacts using their models; – build metamodels for different languages and notations; implement transformation functions using Kermeta.

Description of discipline	
Code of discipline	SFT8307
Name of discipline	Blockchain Theory and Technology
Number of credits (ECTS)	4
Course, semester	1, 1
Department	CE&IS
Prerequisites	OOP, Software Engineering Technologies
Postrequisites	Doctor dissertation
Brief course description	The course examines the main technical aspects of Blockchain technology, principles of operation, possible applications and development prospects.
Expected learning outcomes	After successful completion of the course students will be able to: – comfortably discuss and describe the history, technology, and applications of Blockchain; – assess Blockchain applications in a structured manner; – present Blockchain concepts clearly and persuasively; – create a Crypto token.

Description of discipline	
Code of discipline	SFT8306
Name of discipline	Big Data technologies and big systems
Number of credits (ECTS)	4
Course, semester	1, 1
Department	CE&IS
Prerequisites	Data analysis methods

Postrequisites	Doctor dissertation
Brief course description	The study of the latest advances in the analysis, storage and processing of big data.
Expected learning outcomes	After successful completion of the course students will be able to: – explain fundamental programming concepts including data abstraction, storage and structures; – apply computational thinking which includes decomposition, pattern recognition and abstraction; – design algorithms for big data; – interpret the data representation and analysis; apply analytical tools in R and Java.

Description of discipline	
Code of discipline	SFT8310
Name of discipline	Internet of Behaviors
Number of credits (ECTS)	4
Course, semester	1, 1
Department	CE&IS
Prerequisites	OOP, Software Engineering Technologies
Postrequisites	Doctor dissertation
Brief course description	The course explores the foundations of an emerging technological trend – Internet of behaviors as a logical continuation of the Internet of things. Both technical, legal and ethical issues regarding the application of this technology are considered.
Expected learning outcomes	After successful completion of the course students will be able to: – comfortably discuss the history and technological background of IoB; – analyze different aspects of IoB application; – suggest the technological solution to the problem using IoB.