

SYLLABUS
Spring semester 2023-2024 academic year
Educational program “6B06301 Information security systems”

ID and name of course	Independent work of the student (IWS)	Number of credits			General number of credits	Independent work of the student under the guidance of a teacher (IWST)
		Lectures (L)	Practical classes (PC)	Lab. classes (LC)		
5411 Programming languages	4	1.7	0	3.3	5	9
ACADEMIC INFORMATION ABOUT DISCIPLINE						
Training format	Cycle, component	Lecture types	Types of practical exercises	Shape and platform final control		
Offline	BD, KV	Problem-oriented	Learn Python programming language concepts and implement programs to strengthen practical skills	Oral offline		
Lecturer - (s)	Vladislav Karyukin					
e-mail:	vladislav.karyukin@gmail.com vladislav.karyukin@kaznu.kz					
Phone:	+77019405992					
Assistant - (s)	Vladislav Karyukin					
e-mail:	vladislav.karyukin@gmail.com vladislav.karyukin@kaznu.kz					
Phone:	+77019405992					
ACADEMIC PRESENTATION OF THE DISCIPLINE						
Purpose of the discipline	Expected learning outcomes (LO) *			Indicators of LO achievement (ID)		
This course focuses on learning the concepts of the Python and C# programming languages and understanding their practical implementation by solving real-world problems of varying complexity.	1. (cognitive) Know the theoretical and methodological concepts of C # and Python languages			1.1 Creates basic and advanced programs in C# and Python		
				1.2 Understands the features of classes and objects, as well as OOP paradigms: inheritance, encapsulation, polymorphism and abstraction		
				1.3 Understands application development techniques in C # and Python		
	2. (functional) Application knowledge on working with C# .Net language and Python's NumPy, Pandas and Matplotlib libraries			2.1 Develops programs to create and visualize data sets in an integrated Python workbench		
				2.2 Uses libraries for working with data in C# and Python		
				2.3 Develops applications that are understandable to both developers and users		
	3. (functional) Development of programs of various levels of complexity: from a simple console to a product of academic and industrial significance.			3.1 Able to connect to databases and files to input and output information		
				3.2 Able to configure application configurations		
				3.3 Can create applications in C # and Python		
	4. (system) Creation of complex multifunctional applications			4.1 Creates application diagrams with methods for processing and storing information		
				4.2 Creates interactions between various structural elements		
	5. (system) Creating web applications in C # and Python			5.1 Creates a new web application		
5.2 Connects the database to the web application						
5.3 Changes the design of a web application using a style sheet						

Prerequisites	Information-Communication Technologies, Introduction to Information Security
Post-requisites	Object-Oriented Programming, Information Basics of Information Protection
Learning Resources	<p>Literature : Main :</p> <ul style="list-style-type: none"> – Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance , Sue Blumenberg , Elliott Hauser , Aimee Andrion , 2016. – Python Cookbook: Recipes for Mastering Python 3 3rd Edition, Kindle Edition by David Beazley , Brian K. Jones , 2013. – Programming in C# for beginners. Basic information. Alexey Vasiliev, 2018. – C# 7 programming language and .NET and .NET Core platforms. Andrew Troelsen , Philip Jepix , 2022. – Learning Python 5ed: Powerful Object-Oriented Programming, Mark Lutz, 2013. – Fluent Python: Clear, Concise, and Effective Programming, Luciano Ramalho , 2015. <p>Additional :</p> <ul style="list-style-type: none"> – Natural Language Processing with Python and Spacy: A Practical Introduction, Yuli Vasiliev , 2021 – Learning Scientific Programming with Python, Christian Hill, 2021 <p>Professional scientific databases:</p> <ol style="list-style-type: none"> 1. Business incubator № 12 2. Laboratory room 517 3. Laboratory room 323 <p>Internet resources:</p> <ol style="list-style-type: none"> 1. Python Exercises, Practice, Solution – https://www.w3resource.com/python-exercises/ 2. Programming site – https://metanit.com/python/tutorial/1.1.php 3. Free Python course for beginners – https://code-basics.com/ru/languages/python 4. Python. Introduction to Programming – https://younglinux.info/python/course 5. Python tutorial – https://pythonworld.ru/samouchitel-python <p>Software provision : Python IDE, Anaconda Navigator Python, Microsoft Visual Studio, SQL Lite, Microsoft SQL Server, Microsoft Office Word, WinRAR, WordPad, Power Point, Adobe Reader, Paint.</p>
Academic discipline policy	<p>The academic policy of the discipline is determined by <u>the Academic Policy and the Academic Integrity Policy of Al-Farabi KazNU</u> . Documents are available on the main page of the Univer IS .</p> <p>Integration of science and education. Research work of students, undergraduates and doctoral students is a deepening of the educational process. It is organized directly in departments, laboratories, scientific and design departments of the university, and in student scientific and technical associations. Independent work of students at all levels of education is aimed at developing research skills and competencies based on acquiring new knowledge using modern research and information technologies. A teacher at a research university integrates the results of scientific activity into the topics of lectures and seminar (practical) classes, laboratory classes and into the tasks of the SROP, SRO, which are reflected in the syllabus and are responsible for the relevance of the topics of training sessions and tasks.</p> <p>Attendance. The deadline for each task is indicated in the calendar (schedule) for the implementation of the discipline content. Failure to meet deadlines will result in loss of points.</p> <p>Academic integrity. Practical/laboratory classes and SRL develop the student’s independence, critical thinking, and creativity. Plagiarism, forgery, use of cheat sheets, and cheating at all stages of assignments are unacceptable.</p> <p>In addition to the main policies, the observance of academic integrity during theoretical training and exams is regulated by <u>the “Rules for conducting final control”</u> , <u>“Instructions for conducting final control of the autumn/spring semester of the current academic year”</u> , <u>“Regulations on checking students’ text documents for the presence of borrowings”</u> .</p> <p>Documents are available on the main page of the Univer IS .</p> <p>Basic principles of inclusive education. The educational environment of the university is conceived as a safe place where there is always support and equal treatment on the part of the teacher towards all students and students towards each other, regardless of gender, race/ethnicity, religious beliefs, socio-economic status, physical health of the student, etc. All people need the support and friendship of peers and fellow students. For all students, making progress is more about what they can do than what they can't do. Variety enhances all aspects of life.</p> <p>All students, especially those with disabilities, can receive advice by phone/e- mail vladislav.karyukin@gmail.com / +77019405992 or via video call in MS Teams https://teams.microsoft.com/l/team/19%3ACZc3kvvgZEO0XKcRRowkfBFrimopaCfvm1wD5rB4fi81%40thread.tacv2/conversations?groupId=912d454f-e41b-4815-a4ab-273bdba4bee8&tenantId=b0ab71a5-75b1-4d65-81f7-f479b4978d7b</p>

INFORMATION ABOUT TEACHING, LEARNING AND ASSESSMENT

Point -rating letter system for assessing educational achievements				Assessment methods															
Grade	Digital equivalent points	Points, % content	Traditional assessment	<p>Criteria-based assessment is the process of correlating actually achieved learning outcomes with expected learning outcomes based on clearly developed criteria. Based on formative and summative assessment.</p> <p>Formative assessment is a type of assessment that is carried out during everyday learning activities. Is a current indicator of academic performance. Provides operational communication between the student and the teacher. Allows you to determine the student’s capabilities, identify difficulties, help in achieving the best results, and promptly correct the educational process for the teacher. The completion of assignments, activity in the classroom during lectures, seminars, practical classes (discussions, quizzes, debates, round tables, laboratory work, etc.) are assessed. Acquired knowledge and competencies are assessed.</p> <p>Summative assessment – a type of assessment that is carried out upon completion of the study of a section in accordance with the discipline program. Conducted 3-4 times per semester when performing SRO . This is an assessment of mastery of expected learning outcomes in relation to descriptors. Allows you to determine and record the level of mastery of a discipline over a certain period. Learning outcomes are assessed.</p> <table border="1"> <thead> <tr> <th>Formative and summative assessment</th> <th>Points % content</th> </tr> </thead> <tbody> <tr> <td>Activity in lectures</td> <td>0</td> </tr> <tr> <td>Work in practical classes</td> <td>25</td> </tr> <tr> <td>Independent work</td> <td>25</td> </tr> <tr> <td>Project and creative activities</td> <td>10</td> </tr> <tr> <td>Final control (exam)</td> <td>40</td> </tr> <tr> <td>TOTAL</td> <td>100</td> </tr> </tbody> </table>		Formative and summative assessment	Points % content	Activity in lectures	0	Work in practical classes	25	Independent work	25	Project and creative activities	10	Final control (exam)	40	TOTAL	100
Formative and summative assessment	Points % content																		
Activity in lectures	0																		
Work in practical classes	25																		
Independent work	25																		
Project and creative activities	10																		
Final control (exam)	40																		
TOTAL	100																		
A	4.0 _	95-100	Great																
A-	3.67	90-94																	
B+	3.33	85-89	Fine																
B	3.0	80-84																	
B-	2.67	75-79																	
C+	2.33	70-74																	
C	2.0	65-69																	
C-	1.67	60-64	Satisfactorily																
D+	1.33	55-59																	
D	1.0	50-54																	
FX	0.5	25-49	Unsatisfactory																
F	0	0-24																	

Calendar (schedule) for implementing the content of the discipline. Teaching and learning methods.

A week	Topic name	Number of hours	Max. b all
MODULE 1 C# and Python Programming Basics			
1	L1. Introduction to Python and C#	1	
	LC1. Basic operations with numbers	2	5
2	L2. Programming in Python and C #	1	
	LC2. Python Input and Output	2	5
	IWST1. Consultations on the implementation of IWS1 on the topic “Implementation of a project with basic operations in Python and C#”		
3	L3. Variables, Expressions, and Statements	1	
	LC3. for and while loops	2	7
	IWST2. Passing IWS1		20
4	L4. Conditional Expressions	1	
	LC4. Implementation of functions	2	7
5	L5. Functions	1	
	LC5. Strings	2	7
	IWST3. Conducting a colloquium on topics for 1-3 weeks		5
MODULE 2 Working with Data Structures in C# and Python			
6	L6. Loops and iterations	1	
	LC6. Lists	2	7
	IWST4. Consultation on the implementation of IWS2 on the topic “Creating an application for working with data”		
7	L7. Strings	1	
	LC 7. Lines	2	12
	IWST5. Passing IWS2		25
Frontier control 1			100
8	L8. Reading files	1	
	LC 8. Sets	2	5
	IWST6. Consultation on the implementation of IWS3 on the topic “Creating an application with objects and classes”		
9	L9. Lists	1	
	LC9. DateTime objects	2	5
10	L10. Dictionaries	1	
	LC 0. Classes and objects in C# and Python		5
	IWST7. Passing IWS3		25

MODULE 3 Working with C# and Python Libraries			
11	L11. Tuples	1	
	LC11. Operations with NumPy	2	5
	IWST8. Consultation on implementation of IWS4 on the topic “Creating an application with the NumPy and Matplotlib libraries”		
12	L12. Regular Expressions	1	
	LC12. Operations with Pandas	2	5
13	L13. Python objects	1	
	LC13. Matplotlib	2	5
	IWST9. Passing IWS4		25
14	L14. Relational Databases and PostgreSQL	1	
	LC14. Python Applications with PostgreSQL	2	10
15	L15. Receiving and visualizing data	1	
	LC15. Django Framework	2	10
Frontier control 2			100
Final control (exam)			100
TOTAL for discipline			100

SUMMATIVE ASSESSMENT RUBRICATOR
CRITERIA FOR ASSESSING LEARNING RESULTS

IWS1. Implementation of a project with basic operations in Python and C# (20% of 100% BC1)

Criterion	“Great” 16-20%	“Fine” 11-15%	“Satisfactory” 6-10%	“Unsatisfactory” 0-5%
Knowledge and understanding of the basic elements of the C# and Python languages	Understanding the degree of relevance, relevance and reliability of the data found. Knowledge and understanding of all basic elements and operations of the C# and Python languages	Understanding the degree of relevance, relevance and reliability of the data found. Knowledge of most C# and Python operations	Limited understanding of the appropriateness, relevance, and validity of C# and Python language elements and operations	Superficial understanding/lack of understanding of the degree of relevance, relevance and reliability of the data found. Lack of knowledge of C# and Python elements and operations
Coding skills	Clear and clear presentation of the program code, absence of syntax errors in the code	There are small logical errors in the program code	A large number of logical and syntax errors in the program code, which make it practically unworkable	No code or just a few lines of code
Writing a report	The writing demonstrates clarity, conciseness, and accuracy.	The writing demonstrates clarity, conciseness and correctness. Mostly no errors.	There are some key errors in the writing and the clarity needs improvement.	The writing is unclear and it is difficult to follow the content. Lots of errors in the text

IWS2. Creating an application for working with data (25 % of 100% BC1)

Criterion	“Great” 21 - 25%	“Fine” 11-20%	“Satisfactorily” 6-10%	“Unsatisfactory” 0-5%
Working with data in the application	Understand the degree of compliance, relevance and reliability of the data in the application. Knowledge and understanding of all basic database connection operations in Python	Understanding the degree of relevance, relevance and reliability of the data found. Knowledge of most Python operations	Limited understanding of the consistency, relevance, and validity of Python database connection operations	Superficial understanding/lack of understanding of the degree of compliance, relevance and reliability of working with databases .Lack of knowledge of database connection operations in Python
Coding skills	Clear and clear presentation of program code, absence of syntax errors in the code	There are small logical errors in the program code	A large number of logical and syntax errors in the program code , which make it practically unworkable	No code or just a few lines of code
Writing a report	The writing demonstrates clarity, conciseness, and accuracy.	The writing demonstrates clarity, conciseness and correctness. Mostly no errors.	There are some key errors in the writing and the clarity needs improvement.	The writing is unclear and it is difficult to follow the content. Lots of errors in the text

IWS3. Creating an application with objects and classes (25% of 100% BC2)

Criterion	“Great” 21 - 25%	“Fine” 11 - 20%	“Satisfactory” 6 - 10%	“Unsatisfactory” 0-5%
Knowledge of solutions to test tasks	Full understanding of all test tasks and correct answers to them	Almost complete understanding of test items and answers to them	Partial understanding of test items	Lack of understanding of test tasks and answers to questions asked
Writing program code for test tasks	Clear and clear presentation of the program code, absence of syntax errors in the code	There are small logical errors in the program code	A large number of logical and syntax errors in the program code , which make it practically unworkable	No code or just a few lines of code
Writing a report	The writing demonstrates clarity, conciseness, and accuracy.	The writing demonstrates clarity, conciseness and correctness. Mostly no errors.	There are some key errors in the writing and the clarity needs improvement.	The writing is unclear and it is difficult to follow the content. Lots of errors in the text

IWS4. Creating an application with the NumPy and Matplotlib libraries (25% of 100% BC2)

Criterion	“Great” 21-25%	“Fine” 11-20%	“Satisfactory” 6-10%	“Unsatisfactory” 0-5%
Knowledge and understanding of Python’s NumPy and Matplotlib libraries	Understand the consistency, relevance, and reliability of working with Python libraries. Knowledge and understanding of all basic operations Python libraries	Understand the consistency, relevance, and reliability of working with Python libraries. Knowledge and understanding of most of all basic Python library operations	Limited understanding of basic Python library operations	Superficial understanding/lack of understanding basic Python library operations
Coding skills	Clear and clear presentation of the program code, absence of syntax errors in the code	There are small logical errors in the program code	A large number of logical and syntax errors in the program code , which make it practically unworkable	No code or just a few lines of code
Writing a report	The writing demonstrates clarity, conciseness, and accuracy.	The writing demonstrates clarity, conciseness and correctness. Mostly no errors.	There are some key errors in the writing and the clarity needs improvement.	The writing is unclear and it is difficult to follow the content. Lots of errors in the text

Dean _____ **Turar O.N.**

Head of the department _____ **Mussiraliyeva Sh.Zh.**

Lecturer _____ **Karyukin V.I.**