SYLLABUS
Fall semester 2023-2024 academic year
Educational program "6B06102 – Information 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)		
101287 Object-oriented programming	5	3	0	6	9	9

ACADEMIC INFORMATION ABOUT THE COURSE

Learning Format	Cycle, component	Lecture types	Types of practical classes	Form and platform final control
Offline	CD, UC	Problem-oriented	Learning the concepts of object-oriented programming and implementing programs to practice practical skills	Oral, offline

Lecturer - (s)	Karyukin Vladislav Igorevich
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ACADEMIC COURSE PRESENTATION

Purpose of the course	Expected Learning Outcomes (LO) *	Indicators of LO achievement (ID)
This course is aimed at studying the concepts of object-oriented programming, as well as understanding their practical implementation by solving real-life practical problems of varying complexity.

The purpose of discipline is mastering of knowledge and abilities of using mechanisms and instruments of object-oriented programming. The following topics are considered: a program structure, preprocessor directives, data types, one-dimensional and two-dimensional arrays, functions, character strings, criteria of object orientation, readiness for reuse, abstract data types, classes, objects, memory management, | 1. (cognitive) Know theoretical and methodological concepts of OOP | 1.1 the ability to build diagrams of classes and objects |
		1.2 know the features of classes and objects, as well as OOP paradigms: inheritance, encapsulation, polymorphism and abstraction
	2. (functional) Apply knowledge of OOP concepts to create console applications and Windows forms	2.1 create programs for input and output of data in the console and implement the console user interface
		2.2 develop multifunctional Windows applications that are well understood by both developers and users
	3. (functional) Apply OOP paradigms to compose programs of various levels of complexity: from simple console to a product of academic and industrial importance	3.1 be able to connect to databases and files for input and output of information
		3.2 create tabular display forms in Windows forms
	4. (system) Creation of complex multifunctional applications	4.1 create application diagrams with methods for processing and storing information
		4.2 build the interaction of various structural elements with each other
	5. (system) Creating an application with the graphical user interface (GUI)	5.1 Creating a new application with GUI

universalization, and building reliable software.		5.2 Connecting a database to the application
		5.3 Changing an interface of the application

Prerequisites	Algorithms, data structures and programming
Postrequisites	Web programming, Programming on Python language

Learning Resources	**Literature:**
	Main:
	    – Bill Wagner. More Effective C# (Includes Content Update Program): 50 Specific Ways to Improve Your C# (Effective Software Development Series) 2nd Edition, 2017
	    – Jon Skeet. C# in Depth: Fourth Edition 4th Edition, 2019
	    – Dan Clark. Beginning C# Object-Oriented Programming (Expert's Voice in .NET) 2nd ed. Edition, 2013
	    – Raihan Taher. Hands-On Object-Oriented Programming with C#: Build maintainable software with reusable code using C# Paperback – February 28, 2019
	    – Svetlin Nakov, Vesselin Kolev. Fundamentals of Computer Programming with C#: Programming Principles, Object-Oriented Programming, Data Structures (free programming books) Paperback – February 9, 2014
	Additional:
	    – The videocourse The Complete C# and Object-Oriented Programming Course available in OneDrive
	Internet resources:
	    – Programiz. https://www.programiz.com/cpp-programming/library-function/cstdlib/labs
	    – C# Tutorial. https://www.w3schools.com/cs/index.php
	    – C# programming guide. https://learn.microsoft.com/en-us/dotnet/csharp/programming-guide/
	Software and internet resources:
	Microsoft Visual Studio, Microsoft SQL Server, Microsoft Office Word, WinRAR, WordPad, Power Point, Adobe Reader, Paint.

Academic course policy	The academic policy of the course is determined by the Academic Policy and the Policy of Academic Integrity of Al-Farabi Kazakh National University. Documents are available on the main page of IS Univer. **Integration of science and education.** The research work of students, undergraduates and doctoral students is a deepening of the educational process. It is organized directly at the departments, laboratories, scientific and design departments of the university, 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 obtaining new knowledge using modern research and information technologies. A research university teacher integrates the results of scientific activities into the topics of lectures and seminars (practical) classes, laboratory classes and into the tasks of the IWST, IWS, which are reflected in the syllabus and are responsible for the relevance of the topics of training sessions and assignments. **Attendance.** The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the course. Failure to meet deadlines results in loss of points. **Academic honesty.** Practical/laboratory classes, IWS develop the student's independence, critical thinking, and creativity. Plagiarism, forgery, the use of cheat sheets, cheating at all stages of completing tasks are unacceptable. Compliance with academic honesty during the period of theoretical training and at exams, in addition to the main policies, is regulated by the "Rules for the final control", "Instructions for the final control of the autumn / spring semester of the current academic year", "Regulations on checking students' text documents for borrowings". Documents are available on the main page of IS Univer. **Basic principles of inclusive education.** The educational environment of the university is conceived as a safe place where there is always support and equal attitude from the teacher to all students and students to 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, progress is more about what they can do than what they can't. Diversity enhances all aspects of life.

All students, especially those with disabilities, can receive counseling assistance by vladislav.karyukin@gmail.com / +77019405992 or via video link in MS Teams

INFORMATION ABOUT TEACHING, LEARNING AND ASSESSMENT

Score-rating letter system of assessment of accounting for educational achievements				Assessment Methods
Grade	Digital equivalent points	points, % content	Assessment according to the traditional system	**Criteria-based assessment** is the process of correlating actual learning outcomes with expected learning outcomes based on clearly defined criteria. Based on formative and summative assessment.
A	4.0 _	95-100	Great	**Formative assessment is** a type of assessment that is carried out in the course of daily learning activities. It is the current measure of progress. Provides an operational relationship between the student and the teacher. It allows you to determine the capabilities of the student, identify difficulties, help achieve the best results, timely correct the educational process for the teacher. The performance of
A-	3.67	90-94		
B+	3.33	85-89	Fine	tasks, the activity of work in the classroom during lectures, seminars, practical exercises (discussions, quizzes, debates, round tables, laboratory work, etc.) are evaluated. Acquired knowledge and competencies are assessed. **Summative assessment** - type of assessment, which is carried out upon completion of the study of the section in accordance with the program of the course. Conducted 3-4 times per semester when performing IWS. This is the assessment of mastering the expected learning outcomes in relation to the descriptors. Allows you to determine and fix the level of mastering the course for a certain period. Learning outcomes are evaluated.
B	3.0	80-84		**Formative and summative assessment** / **Points % content**
B-	2.67	75-79		
C+	2.33	70-74		
C	2.0	65-69	Satisfactorily	Activity at lectures — 0
C-	1.67	60-64		Work in practical classes — 25
D+	1.33	55-59		Independent work — 25
D	1.0	50-54		Design and creative activity — 10
FX	0.5	25-49	Unsatisfactory	Final control (exam) — 40
F	0	0-24		TOTAL — 100

Calendar (schedule) for the implementation of the content of the course. Methods of teaching and learning.

A week	Topic name	Number of hours	Max. ball
	MODULE 1 Fundamentals of object-oriented programming		
1	L 1. Fundamentals of C# language	2	0
	LC 1. Simple operations in C#	4	5
2	L 2. Fundamentals of object-oriented programming	2	0
	LC 2. Operations with structs and strings	4	5
	IWST 1. Consultations on the implementation of IWS 1		
3	L 3. Concepts of object-oriented programming	2	0
	LC 3. Loops, functions and recursions	4	10
	IWS 1. Implementation of project with classes		20
4	L 4. Inheritance, encapsulation, polymorphism and abstraction	2	0
	LC 4. Creating classes and objects	4	10
	IWST 2. Acceptance of IWS 1		
5	L 5. Constructors and destructors	2	0
	LC 5. Creating constructors and work with access modifiers	4	10
	IWST 3. Consultation on the implementation of IWS 2		
	MODULE 2 Windows Forms applications		
6	L 6. Types of classes. Sealed and partial classes	2	0
	LC 6. Building constructors and destructors for the class Person	4	10
	IWS 2. Implementation of project with constructors and destructors		20
7	L 7. Comparison between structs and enumerators	2	0
	LC 7. Building structs and enumerators	4	10
	IWST 4. Acceptance of IWS 2		
Midterm control 1			100
8	L 8. Collections	2	0
	LC 8. Creating Photobook classes	4	5
	IWST 5. Consultations on the implementation of IWS 3		
9	L 9. Windows forms applications	2	0
	LC 9. Designing the Windows Forms application	4	5
	IWS 3. Creating Notepad in Windows Forms		10

10	L 10. Creating elements of Windows forms	2	0
	LC 10. Adding buttons to Windows forms	4	5
	IWST 6. Acceptance of IWS 3		
MODULE 3 Advanced Windows Forms applications			
11	L 11. Exception handling in Windows forms	2	0
	LC 11. Adding exception handling to Windows forms	4	5
	IWST 7. Consultation on the implementation of IWS 4		10
12	L12. CRUD operations in Windows Forms	2	0
	LC 12. Adding CRUD operations to Windows Forms	4	10
	IWS 4. Creating elements in Windows Forms		10
13	L 13. Working with XML files	2	0
	LC 13. Adding information to XML files	4	10
	IWST 8. Acceptance of IWS 4		
14	L 14. ListViews and TreeViews in Windows Forms	2	0
	LC 14. Adding ListViews and TreeViews to Windows Forms	4	10
	IWST 9. Consultation on the implementation of IWS 5		
15	L 15. Visualization in Windows Forms	2	0
	LC 15. Adding images to Windows Forms	4	10
	IWS 5. Creating a gallery in Windows Forms		10
Midterm control 2			100
Final control (exam)			100
TOTAL for course			100

Dean _____ Urmashev B.A.

Head of Department _____ Mussiraliyeva Sh.Zh.

Lecturer _____ Karyukin V.I.

RUBRICATOR OF THE SUMMATIVE ASSESSMENT

CRITERIA EVALUATION OF LEARNING OUTCOMES

IWS 1. Implementation of project with classes (20% of 100% of MC1)

Criterion	"Excellent" Max. weight in 16-20%	"Good" Max. weight in 11-15%	"Satisfactory" Max. weight in 5-10%	"Unsatisfactory" Max. weight in 1-4%
Knowledge and understanding of basic concepts of classes and objects	Understanding the degree of relevance and reliability of the data found. Knowledge and understanding of all object and class concepts	Understanding the degree of relevance and reliability of the data found. Knowledge of most operations with classes and objects	Limited understanding of the relevance and validity of classes and objects	Superficial understanding/lack of understanding of the degree of relevance and reliability of the data found. Lack of concept of classes and objects
Coding skills	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

IWS 2. Implementation of project with constructors and destructors (20% of 100% of MC1)

Criterion	"Excellent" Max. weight in 16-20%	"Good" Max. weight in 11-15%	"Satisfactory" Max. weight in 5-10%	"Unsatisfactory" Max. weight in 1-4%
Knowledge and understanding of basic concepts of constructors and destructors	Understanding the degree of relevance and reliability of the data found. Knowledge and understanding of all constructors and destructors concepts	Understanding the degree of relevance and reliability of the data found. Knowledge of most operations with constructors and destructors	Limited understanding of the relevance and validity of constructors and destructors	Superficial understanding/lack of understanding of the degree of relevance and reliability of the data found. Lack of concept of constructors and destructors
Coding skills	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

IWS 3. Creating Notepad in Windows Forms (10% of 100% of MC2)

Criterion	"Excellent" Max. weight in 9-10%	"Good" Max. weight in 5-8%	"Satisfactory" Max. weight in 3-4%	"Unsatisfactory" Max. weight in 1-2%
Knowledge and understanding of basic concepts of Notepad in Windows Forms	Understanding the degree of relevance and reliability of the data found. Knowledge and understanding of the Notepad in Windows Forms	Understanding the degree of relevance and reliability of the data found. Knowledge of most operations with the Notepad in Windows Forms	Limited understanding of the relevance and validity of the Notepad in Windows Forms	Superficial understanding/lack of understanding of the degree of relevance and reliability of the data found. Lack of concept of the Notepad in Windows Forms
Coding skills	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

IWS 4. Creating elements in Windows Forms (10% of 100% of MC2)

Criterion	"Excellent" Max. weight in 9-10%	"Good" Max. weight in 5-8%	"Satisfactory" Max. weight in 3-4%	"Unsatisfactory" Max. weight in 1-2%
Knowledge and understanding of basic concepts of elements in Windows Forms	Understanding the degree of relevance and reliability of the data found. Knowledge and understanding of elements in Windows Forms	Understanding the degree of relevance and reliability of the data found. Knowledge of most operations with elements in Windows Forms	Limited understanding of the relevance and validity of elements in Windows Forms	Superficial understanding/lack of understanding of the degree of relevance and reliability of the data found. Lack of concept of elements in Windows Forms
Coding skills	Clear presentation of the program code, absence of syntax errors in the code	There are small logical errors in 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

IWS 5. Creating a gallery in Windows Forms (10% of 100% of MC2)

Criterion	"Excellent" Max. weight in 9-10%	"Good" Max. weight in 5-8%	"Satisfactory" Max. weight in 3-4%	"Unsatisfactory" Max. weight in 1-2%
Knowledge and understanding of basic concepts of a gallery in Windows Forms	Understanding the degree of relevance and reliability of the data found. Knowledge and understanding of a gallery in Windows Forms	Understanding the degree of relevance and reliability of the data found. Knowledge of most operations with a gallery in Windows Forms	Limited understanding of the relevance and validity of a gallery in Windows Forms	Superficial understanding/lack of understanding of the degree of relevance and reliability of the data found. Lack of concept of a gallery in Windows Forms
Coding skills	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