**Syllabus**

**Fall semester 2020-2021 у.г.**

**On the educational program «6B06102 – Information systems»**

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| **Code of the discipline** | **Name of the discipline** | | **ISW** | **A number of hours in a week** | | | | | | **A number of credits** | | **ISWT** | |
| **Lecture** | | **Practice** | | **Laboratory** | |
| OOP 2206 | Object-oriented programming | | 98 | 15 | |  | | 30 | | 3 | | 6 | |
| **Academic information about the course** | | | | | | | | | | | | | |
| Type of studying | Type of the course | | Type of the lecture | | Type of the practice | | | | A number of ISW | | Type of the final control | | |
| Offline / Online | Theoretical, practical | | Problem oriented | | Learning the concepts of object-oriented programming and implementing programs to practice practical skills | | | | Not less than 3 | | Written exam | | |
| **Lecturer** | Karyukin Vladislav Igorevich | | | | | | | | **Office hour** | | According to the schedule | | |
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| **Laboratory work** | Карюкин Владислав Игоревич | | | | | | | |  | |  | | |
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| **Academic presentation of the course** | | | | | | | | | | | | | |
| **The purpose of the course**  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. | | **Expected results of studying (RS)** | | | | | Indicators of achieving RS (for each RS at least 2 indicators) | | | | | | |
|  | | **RS1** (cognitive) Know theoretical and methodological concepts of OOP | | | | | * 1. – the ability to build diagrams of classes and objects   2. – know the features of classes and objects, as well as OOP paradigms: inheritance, encapsulation, polymorphism and abstraction | | | | | | |
| **RS2** (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 | | | | | | |
| **RS3 (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 - creating tabular display forms in Windows forms | | | | | | |
|  | |  | | | | |  | | | | | |
| **RS 4 (system)** Creation of complex multifunctional applications | | | | | 4.1 - create application diagrams with methods for processing and storing information 4.2 - building the interaction of various structural elements with each other | | | | | |
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| Prerequisites and postrequisites | | **Prerequisites:** Programming, database fundamentals  **Postrequisites:** Web programming | | | | | | | | | | |
| Литература и ресурсы | | Literature:  **Main:** Bill Wagner. More Effective C# (Includes Content Update Program): 50 Specific Ways to Improve Your C# (Effective Software Development Series) 2nd Edition.Jon Skeet. C# in Depth: Fourth Edition 4th EditionDan Clark. Beginning C# Object-Oriented Programming (Expert's Voice in .NET) 2nd ed. EditionRaihan Taher. Hands-On Object-Oriented Programming with C#: Build maintainable software with reusable code using C# Paperback – February 28, 2019Svetlin 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  **Resources**  **- Software and internet resources:**  Microsoft Visual Studio, Microsoft SQL Server, Microsoft Office Word, WinRAR, WordPad, Power Point, Adobe Reader, Paint.  **Online availability**: additional study materials, homework assignments and projects can be found in EMCD at univer.kaznu.kz. | | | | | | | | | | |
| Academic policy of the course in the context of university moral and ethical values | | **Rules of academic conduct**: 1. For each classroom session, you should prepare in advance according to the schedule below. The preparation of the assignment should be completed before the classroom session where the topic is discussed. 2. Academic values: 1. IWS laboratory exercises should be independent, creative. 2. Plagiarism, forgery, the use of cheat sheets, cheating at all stages of knowledge control are inadmissible Students with disabilities can receive consulting assistance by email - vladislav.karyukin@gmail.com | | | | | | | | | | |
| Evaluation policy | | **Criteria evaluation**: assessment of learning outcomes in relation to descriptors (checking the formation of competencies at midterm control and exams). **Summative evaluation**: assessment of the activity of work in the classroom; assessment of the completed assignment. | | | | | | | | | | |

**Academic calendar and the content of the course**

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| Week | A name of the topic | RS | ID | A number of hours | Maximum points | Knowledge evaluation form | A form of classes / platform |
| 1 | **L1.** Fundamentals of C# language | RS1 | ID 1.1. | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 1 | **LW1**. Simple operations in C# | RS1 | ID 2.2 | 2 | 5 | A report in Word file | Classroom, webinar in MS Teams |
| 2 | **L2.** Fundamentals of object-oriented programming | RS1 | ИД 1.1 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 2 | **LW2.** Operations with structs and strings | RS1 | ID 1.1 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 3 | **L3.** Concepts of object-oriented programming | RS2 | ID 2.1 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 3 | **LW3**. Loops, functions and recursions | RS2 | ID 1.2 | 1 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 3 | **ISWT1.** Consultation on doing ISW1 |  |  |  | 0 |  | Classroom, webinar in MS Teams |
| 3 | **ISW1.** Implementation of project with classes | RS1 | ID 1.1 |  | 25 |  | Classroom, webinar in MS Teams |
| 4 | **L4.** Inheritance, encapsulation, polymorphism and abstraction | RS1 | ID 1.1 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 4 | **LW4**. Creating classes and objects | RS2 | ID 2.1 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 5 | **L5.** Constructors and destructors | RS2 | ID 2.1 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 5 | **LW5.** Creating constructors and work with access modifiers | RS2 | ID 2.2 | 2 | 15 | A report in Word file | Classroom, webinar in MS Teams |
| 5 | **ISWT2.** Consultation on doing ISW 2 |  |  |  | 0 |  | Webinar in MS Teams |
| 5 | **ISW 2.** Implementation of project with classes 2 | RS1 | ID 1.6 |  | 25 | A report in Word file | Classroom, webinar in MS Teams |
| 5 | **BC 1** |  |  |  | 100 |  |  |
| 6 | **L6.** Types of classes. Sealed and partial classes | RS1 | ID 1.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 6 | **LW6.** Building constructors and destructors for the class Person | RS2 | ID 2.2 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 7 | **LW7.** Comparison between structs and enumerators | RS2 | ID 2.2 | 1 | 10 |  | Classroom, video lecture in MS Teams |
| 7 | **ISWT 3.** Consultation on doing ISW3 |  |  |  | 0 |  | Classroom, webinar in MS Teams |
| 7 | **ISW 3.** Implementation of project with classes 3 | RS1 | ID 1.6 |  | 25 | A report in Word file | Classroom, webinar in MS Teams |
| 8 | **L8.** Collections | RS2 | ID 2.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 8 | **LW8**. Creation Photobook classes | RS2 | ID 2.2 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 9 | **L9.** Windows forms applications | RS4 | ID 4.1 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 9 | **LW9.** Designing the Windows Forms application | RS2 | ID 2.2 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 9 | **ISWT 4.** Consultation on doing ISW 4 |  |  |  | 0 |  | Classroom, webinar in MS Teams |
| 9 | **ISW 4.** Creating Notepad in Windows Forms | RS4 | ID 4.1  ID 4.2 |  | 25 | A report in Word file | Classroom, webinar in MS Teams |
| 10 | **L10.** Creating elements of Windows forms | RS2 | ID 2.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 10 | **LW10.** Adding buttons to Windows forms | RS2 | ID 2.2 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 10 | **МТ (Midterm Exam)** |  |  |  | 100 |  |  |
| 11 | **L11.** Exception handling in Windows forms | RS2 | ID 2.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 11 | **LW11.** Adding exception handling to Windows forms | RS2 | ID 2.2 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 12 | **L12.** CRUD operations in Windows Forms | RS2 | ID 2.1  ID 2.2 | 1 |  |  | Classroom, video lecture in MS Teams |
| 12 | **LW12.** Adding CRUD operations to Windows Forms | RS3 | ID 3.1  ID 3.2 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 13 | **L13.** Working with XML files | RS3 | ID 3.1  ID 3.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 13 | **LW13.** Adding information to XML files | RS3 | ID 3.1  ID 3.2 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 13 | **ISWT 5.** Consultation on doing ISW 5 |  |  |  | 0 |  | Webinar in MS Teams |
| 13 | **ISW5.** Creating a calculator in Windows Forms | RS 4 | ID 4.1  ID 4.2 |  | 25 | A report in Word file | Classroom, webinar in MS Teams |
| 14 | **L14.** ListViews and TreeViews in Windows Forms | RS3 | ID 3.1  ID 3.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 14 | **LW14.** Adding ListViews and TreeViews to Windows Forms | RS3 | ID 3.1  ID 3.2 | 1 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 15 | **L15.** Visualization in Windows Forms | RS3 | ID 3.1  ID 3.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 15 | **LW15.** Adding images to Windows Forms | RS3 | ID 3.1  ID 3.2 | 1 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 15 | **ISWT 6.** Consultation on ISW 6 |  |  |  | 5 |  | Webinar in MS Teams |
| 15 | **ISW 6.** Creating a gallery in Windows Forms | RS4 | ID 4.1  ID 4.2 |  | 25 | A report in Word file | Classroom, webinar in MS Teams |
|  | **BC 2** |  |  |  | 100 |  |  |

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