**SYLLABUS**

**Fall semester 2022-2023 academic year**

**on the educational program "6B06102 - Information Systems"**

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| **Discipline’s code** | **Discipline’s title** | **Independent work of students (IWS)** | **Number of loans** | **Number of credits** | **Independent work of student with teacher (IWST)** |
| **Lectures (L)** | **Practical training (PT)** | **Laboratory (Lab)** |
| PYP 3221 | Python Programming | 98 | 15 | 0 | 30 | 5 | 6 |
| **Academic Course Information** |
| **Form of education** | **Type of course** | **Types of lectures** | **Types of practical training** | **Form of final control** |
| Full-time | Theoretical, practical | Problem-oriented | Learn the concepts of the Python programming language and implement programs to strengthen practical skills | Written exam/Test |
| **Lecturer**  | Karyukin Vladislav Igorevich |  |
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| **Telephone number** | +77019405992 |

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| **Aim of course** | **Expected Training Results (RO) \***As a result of the study of the discipline, the student will be able to: | **Indicators of RO achievement (ID)**(for each thrust reverser not less than 2 indicators) |
| This course is aimed at studying the concepts of the Python programming language, as well as understanding their practical implementation by solving real problems of various complexity. | 1. (cognitive) Know the theoretical and methodological concepts of Python
 | 1.1 ability to create basic and advanced programs on Python |
| 1.2 Know the characteristics of classes and objects, as well as the paradigms of PLO: inheritance, encapsulation, polymorphism and abstraction |
| 1.3 Knowledge of Python Application Development Methods |
| 1. (functional) Application of knowledge on working with libraries NumPy, Pandas and Matplotlib
 | 2.1 Develop programs to create and visualize datasets in an integrated Python environment |
| 2.2 Using Libraries to Work with Data |
| 2.3developing multifunctional applications that both developers and users understand |
| 1. **(**functional) Developing programs of various complexity levels: from a simple console to a product of academic and industrial importance.
 | 3.1 Be able to connect to databases and files for information input and output |
| 3.2 Be able to configure applications |
| 3.3 Be able to create applications on Python |
| 1. Building complex, multifunctional applications
 | 4.1 Creating Application Charts with Information Processing and Storage Methods |
| 4.2 constructing interaction of various structural elements between each other |
| 4.3 Modifying and Editing Applications |
| 5. Creating Web Applications on Python | 5.1 Create a New Web Application |
| 5.2 connect the database to the web application |
| 5.3 Change the Design of a Web Application Using a Stylesheet |
| **Prerequisites** | Fundamentals of Information Systems |
| **Post requisites** | Python Web Applications in Django and Flask |
| **Information resources \*\*** | **Literature:****Basic:**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.Advanced Python Development: Using Powerful Language Features in Real-World Applications 1st ed. Edition by Matthew Wilkes, 2021.Learning Python 5ed: Powerful Object-Oriented Programming, Mark Lutz, 2013.Fluent Python: Clear, Concise, and Effective Programming, Luciano Ramalho, 2015.**Additional:**1. Natural Language Processing with Python and spaCy: A Practical Introduction, Yuli Vasiliev, 2021
2. Learning Scientific Programming with Python, Christian Hill, 2021

**Resources:****Software and Internet Resources:**Python IDE, Anaconda Navigator Python, Microsoft Visual Studio, SQL Lite, Microsoft SQL Server, Microsoft Office Word, WinRAR, WordPad, Power Point, Adobe Reader, Paint.**Online accessibility**: additional training materials, homework and projects can be found in EMCD on univer.kaznu.kz. |

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| **Academic policy of the course in the context of university moral and ethical values** | **Rules of academic behavior:** 1. You should prepare for each class in advance according to the schedule below. The task must be completed before the class in which the topic is discussed. 2. Academic values: 1. Laboratory classes and CCF shall be performed on their own 2. Plagiarism, forgery of documents, the use of cheats, writing off at all stages of knowledge control are unacceptable. Students with disabilities can receive counseling via e-mail - vladislav.karyukin@gmail.com |
| **Evaluation and attestation policy** | **Criteria-based evaluation**: evaluation of training results by descriptors (verification of competencies formation on intermediate control and exams). **Summative evaluation:** evaluation of activity in lessons, evaluation of completed task. |

**Training course content implementation calendar (schedule)**

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| **Week** | **Topic name** | **Number of hours** | **Max.****score \* \* \*** |
| **Module 1 Python Programming Basics** |
| 1 | **L 1.** Introduction to Python | 1 | 0 |
| **Lab 1.** Basic Number Operations | 2 | 5 |
| 2 | **L 2.** Programming on Python | 1 | 0 |
| **Lab 2.** Python Input and Output | 2 | 5 |
| **IWST 1.** Consultation on the implementation of IWS 1 | 1 | 5 |
| 3 | **L 3.** Variables, Expressions, and Approvals | 1 | 0 |
| **Lab 3.** Cycles for and while | 2 | 7 |
| **IWS 1.** Project implementation with basic Python operations. | 0 | 20 |
| 4 | **L 4.** Conditional expressions | 1 | 0 |
| **Lab 4.** Implementation of functions | 2 | 7 |
| **IWST 2.** Test | 1 | 20 |
| 5 | **L 5.** Functions | 1 | 0 |
| **Lab 5.** Lines | 2 | 7 |
| **Module 2 Working with Python Data Structures** |
| 6 | **L 6.** Cycles and Iterations | 1 | 0 |
| **Lab 6.** Lists | 2 | 7 |
| 7 | **L 7.** Lines | 1 | 0 |
| **Lab 7.** Lines | 2 | 7 |
| **IWST 3.** Consultation on the implementation of IWS 2. | 1 | 10 |
| **BC 1** |  |  | 100 |
| 8 | **L 8.** Reading files | 1 | 0 |
| **Lab 8.** Sets | 2 | 5 |
| **IWS 2.** Creating a Data Application | 0 | 10 |
| 9 | **L 9.** Lists | 1 | 0 |
| **Lab 9.** Objects DateTime | 2 | 5 |
| 10 | **L 10.** Dictionaries | 1 | 0 |
| **Lab 10.** Classes and Objects in Python | 2 | 5 |
| **IWST 4.** Test | 1 | 10 |
| **Module 3 Working with Python Libraries** |
| 11 | **L 11.** Trains | 1 | 0 |
| **Lab 11.** Operations with NumPy | 2 | 5 |
| 12 | **L12.** Regular expressions | 1 | 0 |
| **Lab 12.** Pandas Operations | 2 | 5 |
| **IWST 5.** Consultation on the implementation of IWS 3. | 1 | 5 |
| 13 | **L 13.** Python Objects | 1 | 0 |
| **Lab 13.** Maplotlib | 2 | 5 |
| **IWS 3** Creating an Application with NumPy and Matplotlib Libraries | 0 | 15 |
| 14 | **L 14.** Relational Databases and PostgreSQL | 1 | 0 |
| **Lab 14.** Python Applications with PostgreSQL | 2 | 5 |
| **IWST 6.** Test | 1 | 10 |
| **15** | **L 15.** Data Acquisition and Visualization | 1 | 0 |
| **Lab 15.** Django Framework | 2 | 10 |
| **IWST 7. Consultation on preparation for examination questions.** | 1 | 5 |
| **BC 2** |  | **100** |

**Dean \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Urmashev B.A.**

**Head of the Department of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mussiraliyeva Sh. Zh.**

**Lecturer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Karyukin V.I.**