



Training program Python application programming

The program was compiled for the course "Python application programming" within the MODERNISATION OF HIGHER EDUCATION IN CENTRAL ASIA THROUGH NEW TECHNOLOGIES (HiEdTec) project.

1. ANNOTATION

The course is intended for bachelors and undergraduates in the field of training "Informatics", the main theoretical issues of programming in Python are considered in close connection with their practical implementation.

2. PURPOSE OF LEARNING

The objective of this course is to study the basics of the theory of machine learning, including discriminant, cluster and regression analysis, mastering the skills of practical solutions to data mining problems.



3. CONTENT OF THE TRAINING PROGRAM

No	THEME	L/P	P/W
1.	Data Visualization in Python	1	2
2.	Python for data analysis	1	2
3.	Python MySQL	1	2
4.	Internet client programming	1	2
5.	Web development	1	2
6.	Python for mobile application	1	2
7.	Game programming with Python	1	2
8.	Python programming: An Introduction to Computer Science	1	2
9.	Foundations of Python Network programming	1	2
10.	Introduction to Computing and Programming Using Python	1	2
11.	Introduction to Computer Science Using Python	1	2
12.	Problem-solving focus	1	2
13.	Practical machine learning with Python	1	2
14.	Python for informatics	1	2
15.	IOS app development using Python	1	2
	Bcero:	15 ч.	30 ч.

L / R - lecture / presentation

P / W - practical tasks / questions

4. TRAINING TECHNOLOGY

Due to the fact that all video lectures will be published on the Internet, the theoretical part of the training, in part or in full, can be carried out remotely.

Demonstrations and exercises will be conducted in the traditional way, i.e. face to face.



4. EXPECTED RESULTS

After completing the courses, students will master theoretical and practical material that contributes to the formation of knowledge, practical skills and programming skills in Python. Electronic video lectures can be used for students of refresher courses

5. BRIEF ORGANIZATIONAL AND METHODOLOGICAL CHARACTERISTICS OF THE DISCIPLINE

Average score is multiplied by 60% with an accuracy of tenths. Final certification in computer science is carried out in the form of computer testing, during which students answer 40 questions. The number of correct answers must be more than 19 to receive certification. The resulting score is added to 60% and the total score is displayed, which is set in the statement.

Untimely performance of the IWS (except for preparation for classes) leads to a decrease in the score:

- by 1/3 if you are late for a week;
- 2 times if you are more than a week late.

Attendance at the classes is compulsory. Good reasons for missing classes do not exempt the student from completing the entire range of practical and independent work. In this case, you are given the opportunity to work it out on an individual assignment and at the time specified by the teacher during the consultations.

In case of being late, the student is not allowed to the lesson and is not able to work out the missed lesson.

All classroom time will be divided into lecture and practical sessions. Preparation for each lesson is required, as well as reading all the given material. Your preparation will be checked by the CDS, midterm control issues.

If, for any reason, you were absent during the control event, you are given the opportunity to take it at the teacher's consultations in accordance with the established schedule.

The semester provides for two midterm controls in the form of control questions. Test questions will be conducted on the material of the corresponding block.

The system for assessing the results of educational achievements of students

Knowledge, skills and abilities of students are assessed according to the following system

Table 1



Assessment in letters	Digital equivalent points	In percentage	Criterion
A	4,0	95-100	when given a full, detailed answer to the question, shows a set of conscious knowledge about the features and differences of Data models Mining; stages and content of the knowledge search process, can identify areas of practical application Data Mining; can organize the process of searching for hidden knowledge. Use terminology and a basic understanding of the the composition of tools and the main methods of Data Mining. The answer is formulated in terms of science, stated in literary language, logical, demonstrative, demonstrates the author's position of students
A-	3,67	90-94,9	when a full, detailed answer is given to the question posed, a set of conscious knowledge about Data models Mining; stages and content of the knowledge search process, can identify areas of practical application Data Mining; can organize the process of searching for hidden knowledge. The answer can be traced clear structure, logical sequence, reflecting the essence of the disclosed concepts, theories, phenomena. Knowledge of the object is demonstrated against the background of its understanding in the system of this science and



			interdisciplinary connections. The answer is stated in literary language in terms of science. Deficiencies in the definition of concepts may be made, corrected by students themselves in the process of answering.
B+	3,33	85-89,9	- put in the case when the students are given a full, detailed answer to the question asked, the main provisions of the topic are convincingly revealed in the answer there is a clear structure, a logical sequence reflecting the essence of the concepts, theories and phenomena being disclosed. The answer is stated in literary language in terms of science. In response, admitted deficiencies corrected students with the help of a teacher.
B	3,0	80-84,9	put in the case when given a full, detailed answer to the question, shows the ability to identify significant and insignificant signs, cause-and-effect relationships. The answer is clearly structured, logical, expounded in literary terms in terms of science. There may be mistakes or minor mistakes corrected by students with the help of a teacher.
B -	2,67	75-79,9	put in the case when given a detailed answer to the question, it is shown the ability to identify significant and insignificant signs, cause-and-effect relationships. The answer is clearly structured, logical, stated in terms of



			science. However, minor errors or omissions are made, corrected by students with the help of leading questions..
C+	2,33	70-74.9	put in the case when given an insufficiently complete and insufficiently detailed response. The logic and sequence of presentation have violations. Errors in the disclosure of concepts, the use of terms. The student is not able to independently identify significant and insignificant signs and cause-effect relationships. The student can concretize generalized knowledge, proving their main positions with examples only with the help of a teacher. Speech design requires amendments, correction..
C	2,0	65-69.9	put in the case when given an insufficiently complete and insufficiently detailed response. The logic and sequence of presentation have violations. Errors in the disclosure of concepts, the use of terms. The student is not able to independently identify significant and insignificant signs and cause-effect relationships. The student can concretize generalized knowledge, proving their main positions with examples only with the help of a teacher. Speech design requires amendments, correction.
C-	1,67	60-64.9	put in the case when an incomplete answer is given, the logic and sequence of presentation have significant



			violations. There have been gross errors in determining the essence of the concepts, theories, phenomena that have been disclosed, due to the students' misunderstanding of their essential and non-essential features and connections. There are no conclusions in the answer. The ability to reveal specific manifestations of generalized knowledge is not shown. Speech design requires amendments, correction.
D+	1,33	55-59.9	- put in the case when an incomplete answer is given. There is an irrationality of presentation. Teaching is difficult with evidence. A lot of significant errors in the definitions of terms, concepts, characterization of facts, phenomena. There are no conclusions in the answer. The speech is illiterate. When answering additional questions, the Teacher begins to realize the existence of a connection between knowledge only after the teacher's prompting
D	1,0	50-54.9	- put in the case when an incomplete answer is given, which is a scattered knowledge on the subject of the question with significant errors in the definitions. There are fragmentary, illogical presentation. The teacher is not aware of the connection of this concept, theory, phenomenon with other objects of the module (discipline). There are no



			conclusions, specification and proof of presentation. The speech is illiterate. Additional and clarifying questions of the teacher do not lead to the correction of the student's answer not only to the question posed, but also to other questions of the module (discipline).
FX	0.5	25-49	- put in the event that the student has found gaps in the knowledge of the basic material provided for by the program, has not mastered more than half of the module's program (discipline).
F	0	0-24	has made fundamental mistakes in the answers, has not completed individual tasks provided for by the current, intermediate and final control forms, has not worked main literature provided by the program.

5. RECOMMENDED LITERATURE

Онлайн-платформа для электронного обучения
<http://hiedtec.enu.kz/course/view.php?id=3>

1. Link: [https://www.w3schools.com/python/python_reference.asp];
2. Introduction to Computation and Programming Using Python. With Application to Understanding Data. Second Edition. John V. Guttag. The MIT Press Cambridge, Massachusetts London, England.