

The syllabus of the discipline
Python programming

S.A. Krivenko,
Associate Professor of INE dept, Ph.D., Associate Professor
E-mail: stanislav.krivenko@nure.ua

Field name	Detailed content, comments
Name of the faculty	Faculty of Infocommunications
Level of higher education	First (bachelor's)
Code and name of the specialty	172 Telecommunications and radio engineering
Type and name of educational program	EPP "Information and Network Engineering"
Name of the discipline	Python programming
Number of ECTS credits	3
Discipline structure (distribution by types and hours of study)	24 hours - 12 lectures, 20 hours - 5 laboratory classes, 6 hours - 3 consultations, 70 hours - homework, type of control: credit
Schedule (terms) of studying the discipline	1st year, I and II semesters
Prerequisites for studying the discipline	The basis of successful mastering the course is the knowledge gained students when studying courses "Higher Mathematics"
Competences, knowledge, skills, understanding, which is acquired by the applicant in higher education in the learning process	The discipline is used to form the following competencies: to analyze the principles of building technologies for mobile networks of future generations; navigate in algorithms, Python programs and schemas mobile networks enter the text of Python programs individual modules and perform simulations; formulate and solve the main tasks of operation and reprogramming the mobile network.
The quality of the educational process	Educational-methodical and material-technical resource provision of the educational program, within the framework of which the discipline is studied, meets the licensing requirements and accreditation conditions of the educational activity of the university. Annual monitoring and revision of the curriculum of the discipline in accordance with the requirements and recommendations of the Ministry of Education and Science, state certification of acquired competencies of graduates, standards of cooperation with employers to ensure a competitive level of training. Adherence to the principles of academic integrity (https://lib.nure.ua/plagiat). Contains public information on the requirements, competencies, level of education within the current educational program

Description and content of the discipline

The purpose of studying the discipline is to provide students with an understanding of the role that computing can play in solving problems and to help students, regardless of their specialization, feel justifiably confident in their ability to write small programs that allow them to perform useful purposes. The labs use the Python 3.7 programming language. Introduction to Computer Science and Python Programming is intended for students with little or no programming experience.

Content

Content module 1. Basics of python.

Topic 1. General information.

Topic 2. Branching and iterations.

Topic 3. Manipulations with strings, algorithms such as guess and check, approximation, half-division method.

Content module 2. Object-oriented programming.

Topic 4. Decomposition, abstraction, functions.

Topic 5. Tuples, lists, aliases, change elements, cloning.

Topic 6. Recursion, dictionaries.

Topic 7. Testing, debugging, exceptions, certification.

Topic 8. Object-oriented programming.

Topic 9. Python classes and imitation.

Content module 3. Understanding the effectiveness of the program.

Topic 10. Complexity classes.

Topic 11. Examples specific to each class

Topic 12. Search and sorting algorithms.

Learning outcomes of higher education

As a result of studying the discipline, students must:

to know: general tendencies and problems of development of technologies of mobile communication networks of the next generations; principles and systems of building a modern mobile network; Python languages, basics of organization and composition of mobile network software.

be able to: analyze the principles of building technologies of mobile communication networks of future generations; navigate algorithms, Python programs and mobile network schemes; enter the text of Python programs of individual modules and perform simulations; formulate and solve the main tasks of operation and reprogramming of the mobile network.

Assessment system according to each task for passing the test / exam

To evaluate the student's work during the semester, the final rating is calculated as the sum of grades for different types of classes and for control activities. Each laboratory work is evaluated in 10 points (4 points for attendance, 2 points for

performance, 2 points for report, 2 points for defense). Each test task has 10 points. The credit rating is defined as the ratio of the obtained points to the highest value, which is given in the table. The maximum rating during the semester - 100 points, is defined as the average for three credits.

Type of lesson / control measure	Rating
Lc1,2,3	6
testing task 1	10
Lb 1,2	20
Control point 1	36
Lc 4,5,6,7,8,9	12
testing task 2	10
Lb 3	10
Control point 2	22
Lb 4,5	20
Lc 10,11,12	6
testing task 3	10
Control point 3	36
Total for the semester	104

Qualitative evaluation criteria in the national scale and ECTS

Satisfactory, D, E (60-74). Show the required minimum of theoretical knowledge. Know the ways and methods of solving practical problems and be able to use them in practice.

Well, C (75-89). Firmly know a minimum of theoretical knowledge. Demonstrate the ability to solve a practical problem and justify all stages of the proposed solution.

Excellent, A, B (90-100). Show complete knowledge of basic and additional theoretical material. Unmistakably solve a practical problem, explain and justify the chosen method of solution.

Assessment scale: national and ECTS

The sum of points for all types of educational activities	ECTS assessment	Score on a national scale	
		for exam, course project (work), practice	for offset
90 – 100	A	perfectly	credited
82-89	B	fine	
74-81	C	satisfactorily	
64-73	D		
60-63	E		
35-59	FX	unsatisfactory with the possibility of reassembly	not credited with the possibility of re-assembly
0-34	F	unsatisfactory with mandatory re-examination	not credited with compulsory re-study of the discipline

Methodical support

Basic literature

1. Chun, Wesley. Core python applications programming / Wesley J. Chun. — 3rd ed. Pearson Education, Inc., 2012 – 852p.

Supporting literature

2. Jason R. Briggs. Python for kids. A Playful Introduction to Programming – No Starch Press, Inc., San Francisco, CA 2013 – 318p.

Methodical instructions for different types of classes

3. Metodichni vказivky do laboratornykh robit z dystsypliny «Mova prohrumuvannia Python» dlia studentiv usikh form navchannia spetsialnosti 172 «Telekomunikatsii ta radiotekhnika» [Elekt-ronnyi resurs] / KhNURE; uporiad. S. A. Kryvenko. – Kh., 2018. – 53 s.

Information support

Visual Studio Code Automated Design Package.