

Ilia state university
Faculty of Business, Technology and Education
Bachelor's degree
Syllabus

2.	Course name	Programming in Python
3.	Course Duration	1 semester
4.	Credit amount	6 credits
5.	Contact hours quantity	The number of contact hours: 48 hours. Lecture - 14 hours; practical work - 25 hours; Intermediate exam I, II - 6 hours; final assessment - 3 hours; For independent work: 102 hours.
6.	lecturer	Davit Datunashvili , Invited lecturer e-mail: daviti.datunashvili.1@iliauni.edu.ge <i>Note: Student advisory hours/audiences will be agreed upon at the beginning of the semester and students will be notified via Argus.</i>
7.	on the course admission prerequisite	Managerial statistics ¹ Probability theory and mathematical statistics ²
8.	teaching methods	<ul style="list-style-type: none"> • a lecture • method of practical work; • problem-based learning; • Methods of analysis and synthesis.
9.	The objective of the course	The purpose of the training course is to give the student a basic knowledge of the Python programming language and to develop the skills necessary for data analysis, algorithmic thinking, software product creation, including elementary software application creation, and technical understanding of the process.
10.	basic topics	<ul style="list-style-type: none"> • Concept and basics of programming; • data types and elementary operators; • functions and classes as essential programming mechanisms; • GUI (Graphical User Interface) application creation; • creation of the simplest functional Web application;

¹ Undergraduate program: "Business administration (management, banking and finance, tourism) (main specialties) for students;

² For students of the bachelor's program: "Mathematics (major and additional specialty)".

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11.	of learning Outcomes and Competencies	<p><i>As a result of the successful completion of the training course, the student will develop the following competencies:</i></p> <ul style="list-style-type: none"> • The student knows basic principles, concepts, and mechanisms of programming; • The student knows Python programming language capabilities, related, operations, and functions; • The student knows methods of data visualization and data analysis; • A student can Processing of large numbers of CSV (Comma Separated Values) and Excel files, information extraction, and elementary statistical analysis using Python's Pandas library; • A student can Create a simple functional web or GUI (Graphical User Interface) application, which in turn will help to automate the work process and increase efficiency; • The student can automate and efficiently process large amounts of information, make changes and improve the software they use based on open source principles, created in Python. • The student has developed the skills to follow technological changes, follow scientific innovations, constantly update knowledge, independently search for information, and assess and plan learning needs in the field. 																
12.	Evaluation rule	<p>The educational component is evaluated using a 100-point system:</p> <p>(A) 91-100 The best (B) 81-90 Very good (C) 71-80 Good (D) 61-70 satisfactory (E) 51-60 enough (FX) 41-50 failed, which means that the student needs more work to pass and is allowed to take one additional exam with independent work; (F) 0-40 Failed, which means that the work done by the student is not sufficient and he has to retake the subject.</p> <table border="1"> <thead> <tr> <th>Rate</th><th>limit</th><th>Max. score</th></tr> </thead> <tbody> <tr> <td>activity</td><td rowspan="3">21 points</td><td>10 points</td></tr> <tr> <td>Intermediate exam I</td><td>30 points</td></tr> <tr> <td>Intermediate exam II</td><td>30 points</td></tr> <tr> <td>Final assessment</td><td>10 points</td><td>30 points</td></tr> <tr> <td>all</td><td></td><td>100 points</td></tr> </tbody> </table> <p>Taking the final exam is mandatory for all students!</p> <p>Each component is evaluated as follows:</p> <p>Activity - 10 points</p>	Rate	limit	Max. score	activity	21 points	10 points	Intermediate exam I	30 points	Intermediate exam II	30 points	Final assessment	10 points	30 points	all		100 points
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The activity component allows students to demonstrate theoretical knowledge and participate in practical tasks. Within the framework of the component, the degree of involvement in practical work, the ability to form reasoned opinions and conclusions about the discussed issue, and the ability to analyze and synthesize information will be evaluated.

Evaluation criteria	points received	Max. score
Student participation/ involvement in practical work		6
Asking critical questions about the issue under discussion and giving a competent and reasoned answer to the question.		4

Practical work and Critical questions activity Rate:

- **practical work - 6 points** (1 point each)
- **critical questioning – 4 points** (1 point each)

Mid-term exams and final assessments will be conducted in written format. Each one is appreciated **with a maximum of 30 points**, Includes the material covered before the specific assessment component consists of the following issues:

- **4 test questions - 4 points**(1 point each)
- **4 open questions - 8 points**(2 points each)
- **3 tasks - 18 points**(6 points each)

Test Assessment:

correct answer	wrong answer
1	0

Evaluation of the open question:

Evaluation criteria	points received	Max. score
Knowledge of the question - structure, coherent and completeness of the answer		1
Analysis of information/data		1

Knowledge of the issue:

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		<table><tr><td>The full, complete, and correct answer</td><td>Partially incorrect and incomplete answer</td><td>Incorrect/inappropriate answer to the question</td></tr><tr><td>1</td><td>0.5</td><td>0</td></tr></table>	The full, complete, and correct answer	Partially incorrect and incomplete answer	Incorrect/inappropriate answer to the question	1	0.5	0
		The full, complete, and correct answer	Partially incorrect and incomplete answer	Incorrect/inappropriate answer to the question				
1	0.5	0						
		<p>Analysis of data/information:</p> <table><tr><td>perfect</td><td>satisfactory</td><td>Unacceptable / analysis not presented</td></tr><tr><td>1</td><td>0.5</td><td>0</td></tr></table>	perfect	satisfactory	Unacceptable / analysis not presented	1	0.5	0
perfect	satisfactory	Unacceptable / analysis not presented						
1	0.5	0						
		<p>Types of tasks defined for the exam:</p> <ul style="list-style-type: none">• For the given task, the student must write the appropriate software code;• An algorithm for solving a specific problem will be given, and the student must determine what result will be obtained by performing this algorithm;• Given software code, pseudo-code or a block diagram - the student must determine if there is an algorithmic or syntactic error in the code. <p>Task performance assessment criteria:</p> <p>6 points- the task is completed perfectly;</p> <p>5 points- the written code has minor errors;</p> <p>4 points- The student's approach is essentially correct, but it is allowed significant errors;</p> <p>3 points- the student understood the essence of the task, but the software code is essentially incorrect;</p> <p>2 points- the student wrote a certain fragment of code correctly, which does not correspond to this task;</p> <p>1 point- the student showed a superficial knowledge of any concept covered in the study material;</p> <p>0 points- The student did not answer correctly or the code he wrote is completely wrong.</p>						
13.	Literature and other resources	<p>main literature:</p> <ul style="list-style-type: none">• Python training course of Revaz Tatishvili:https://rtatishvili.gitlab.io/intro-to-python-ge/• Ilia State University computing center, which provides students with a computing environment, where the Python language interpreter will be held;• prepared by the lecturer rider, which relies on the following sources: <ul style="list-style-type: none">✓ Programming in Python 3: A Complete Introduction to the Python Language Book by Mark Summerfield;✓ Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython Book by Wes McKinney;✓ Python Essential Reference Book by David M. Beazley;✓ Effective Python: 59 Specific Ways to Write Better Python Book by Brett Slatkin;						

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		✓ Python Data Science Handbook: Essential Tools for Working with Data Book by Jake VanderPlas; ✓ Python Programming: An Introduction to Computer Science Book by John M. Zelle.	
14.	Theme by week		
	Sunday	learning method	Themes / Activities
	1	Lecture - 2 hours.	Introduction to Python syntax. The Zen of Python
		Practical work - 1 hour.	Setting up the work environment and running the first code.
	2	Lecture - 1 hour.	Data types and variables. <ul style="list-style-type: none"> • types and their purpose; • whole numbers; • Decimals numbers; • Logical values (booleans); • text sequences; • conversions between types; • variables;
		Practical work - 2 hours.	Critical questioning simple mathematical operations. Writing comments in Python.
	3	Lecture - 1 hour.	Arithmetic and assignment operators.
		Practical work - 2 hours.	Practical work : <i>Python as a calculator.</i>

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	4	Lecture - 1 hour.	Functions, functional programming approach: <ul style="list-style-type: none"> • functions and their purpose; • syntax; • arguments; • "default" -values; • scope - scope; • Functional programming
		Seminar - 2 hours.	Critical questioning <i>Operations on numeric and textual data.</i>
	5	Lecture - 1 hour.	Data structures and their methods <ul style="list-style-type: none"> • the list; • The Pleiades • dictionary; • abundance
		Seminar - 2 hours.	Practical work : <i>Changing data and using different structures depending on the logic of the task</i>
	6	Lecture - 1 hour.	Comparison, logical and special operators.
		Seminar - 2 hours.	Data checking, filtering, sorting
	7	Intermediate exam I - 3 hours	

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	8	Lecture - 1 hour.	Conditional operators if, elif, else
		Seminar - 2 hours.	Data checking, filtering, sorting
	9	Lecture - 1 hour.	For and While loops
		Seminar - 2 hours.	Critical questioning Tasks on iterations
	10	Lecture - 1 hour.	Working with files using Python. <ul style="list-style-type: none"> • Concept of the configuration file and reading them programmatically; • Concept of the program's progress (log) and its management; • read(), readlines(), readlines(); • write(), writelines(); • seek function; • Manipulations on files;
		Seminar - 2 hours.	Critical questioning Opening files, editing, simple statistics
	11	Lecture - 1 hour.	Object-oriented programming
		Seminar - 2 hours.	Practical work : "Text Quest" assembling a type of game.
	12	Lecture - 1 hour.	Heredity and composition

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		Seminar - 2 hours.	Practical Teamwork: Preparation of a common project using the principle of heredity
	13	Lecture - 1 hour.	generators and decorators
		Seminar - 2 hours.	Practical Teamwork: Adding new functionality to classes using decorators on a shared project
	14	Intermediate exam II - 3 hours	
	15	Lecture - 1 hour.	<i>An overview of existing Python libraries, their structure, and usage</i>
		Seminar - 2 hours.	Practical work: Creating your own Python library and Numpy - Library and graphicX - on the example of the library
	Final evaluation - 3 hours		

Information for students:

Plagiarism - It is unacceptable to use someone else's work, idea, or opinion without citing the source when presenting the homework or presenting it in writing. In such a case, the lecturer is obliged to leave the student's assignment without evaluation.

Transcribe/dictate - This action is prohibited during any type of activity (homework, exam, report, presentation...). In such a case, the lecturer is obliged to leave the students without evaluation.

The midterm exam can be retaken, If the student misses the mid-term evaluation due to an honorable reason (sickness, need to be at work during the given hours, business trip...). To recover a midterm grade, the student must apply to the administration of the Faculty of Business, Technology, and Education. The lecturer determines the date of re-evaluation. Engaging in discussions/debates is not subject to reinstatement.