

**Syllabus
Academic Year 2024-2025**

1. General Information	
Course title	Introduction to Programming 2 (Python)
Degree cycle (level)/major	6B06102- Software Engineering
Year, term	1, 2
Number of credits	5
Language of delivery:	English
Prerequisites	Introduction to programming 1
Post requisites	The knowledge obtained during the course will be used for the courses "Object-oriented Programming", "Algorithms and Data structures", "Modeling of information security processes", "System Programming", "Web technologies", "Verification and validation of software", etc.
Lecturer(s)	<p>Zamart Ramazanova, MS in Physics, senior-lecturer, Zamart.Ramazanova@astanait.edu.kz Office hours: Wednesday 14:00-15:00, C1.2.237</p> <p>Zarina Kutpanova, MSc in Technical sciences, senior-lecturer, Z.kutpanova@astanait.edu.kz, office hours: C1.1.360</p> <p>Aisulu Nurlankyzy, MSc in Information Systems, teacher, A.Nurlankyzy@astanait.edu.kz, office hours: Thursday 10.00-10.50; Friday 12.00-12.50, C1.3.357</p> <p>Tolegen Akhmetov, Phd in Robotics Engineering, senior-lecturer, tolegen.akhmetov@astanait.edu.kz, office C1.1.357</p> <p>Talapiden Kulyash, MS in Robotics, teacher, K.Talapiden@astanait.edu.kz, office C1.1.349</p> <p>Shyryn Tutkyshbayeva, MSc in computer science, senior-lecturer, Sh.Tutkyshbayeva@astanait.edu.kz, office C1.3.357, Office hours: 14:00-16:00</p> <p>Akylbek Maxutov, MSc in Data Science, teacher, 242681@astanait.edu.kz</p> <p>Aldiyar Salkenov, Master of Engineering in Information Technology, senior-lecturer, aldiyar.salkenov@astanait.edu.kz, office C1.3.357, Office hours: Tuesday 15:00-17:00</p> <p>Angsar Aidarbek, MSc in Data Science, teacher, 242650@astanait.edu.kz</p>
2. Goals, Objectives and Learning Outcomes of the Course	
1. Course Description	The course provides introduction to programming basics, problem-solving methods and algorithm development. This course is developed to learn programming fundamentals and writing algorithms in Python programming language. During this course, students will improve

	programming skills, writing simple algorithms using Python technologies
2. Course Goal(s)	<p>This course's goal is to teach everyone the basics of programming computers using Python. We cover the basics of how one constructs a program from a series of simple instructions and assignments in Python. The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel.</p> <p>Giving the student an initial base in the Python development, with an emphasis on learning basic programming principles, ranging from I/O operations, variable management, using flow control capabilities and implementation.</p>
3. Course Objectives:	<ul style="list-style-type: none"> • To understand of the basic principles of Python • To demonstrate acquaintance of Python syntax • To use the most popular libraries of Python in assignments • To write basic Python functions • To create simple programs • To work with datatypes and convert them • To understand basic programming principles • To solve programming problems using Python; • To apply elementary techniques involving arithmetic operators, mathematical and logic expressions in Python programming • To develop Python programs that use sequential files for input and output.
4. Skills & Competencies	<p>On completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> • independently implement a well-structured solution in Python, based on a problem description • implement fundamental abstract data types in Python, • use the standard library of Python and the most suitable external libraries for a set assignment • implement well-documented self-testing Python programs
5. Course Learning Outcomes:	<p>By the end of this course students will be able to:</p> <ul style="list-style-type: none"> • understand and explain in detail different Python programs • design code and test small Python programs • know the concept of functions in Python • use tuples and data dictionaries • build lists of various • program with basic features of the Python programming language • write Python programs that use conditionals • write Python programs that use compound types • write Python programs that use exceptions • write Python programs that use loops • understand the concept of OOP in Python
6. Methods of Assessment	<ul style="list-style-type: none"> - Quizzes; - Theoretical and practical assignments;
7. Reading List	Assigned reading materials and presentations should be read prior to class. Class lectures and discussions will proceed with supplemental

	<p>and advanced topics, which could be difficult to understand unless students have read the assigned material. Readings are listed in the schedule section. All necessary updates and / or changes to the course will be reflected in the Learning Management System (moodle.astanait.edu.kz).</p> <p><u>Basic Literature:</u></p> <ol style="list-style-type: none"> 1. Starting Out with Python, Second Edition, Tony Gaddis, Addison-Wesley, 2012; 2. Learning Python, Fifth Edition, Mark Lutz, O'Reilly, 2013; 3. Head First Python, Second Edition, Paul Barry, O'Reilly, 2017; 4. Python Programming, Hans-Petter Halvorsen, 2020; 5. Eric Matthes. Python Crash Course : A hands-on, project-based introduction to programming / M. Eric. - 2 ed. - USA : No Starch Press, 2019. - 506. - ISBN 978-1-59327-603-4 : 24400.00. 004.43 - M 40. 6. Berajah Jayne, Python Programming Language : A QuickStudy Digital Reference Guide, 2019. <p><u>Supplementary literature:</u></p> <ol style="list-style-type: none"> 1. Lecture notes (available on moodle.astanait.edu.kz) 2. https://cs50.harvard.edu/python/2022/ 3. http://www.programiz.com/python-programming
1. Resources	<p>https://replit.com/</p> <p>https://docs.python.org/3/reference/</p>
2. Course policy	<p>Course and University policies include:</p> <p>Attendance: Attendance is not allocated any grading points in the marking scheme, but is compulsory to pass the course. Normally students are required to achieve course attendance of minimum 70% to get admitted to the examination rubric.</p> <p>In case a student misses 30% or more class sessions without a valid excuse the instructor has the right to mark him as “not graded”. In such case a student is not admitted to the exam and automatically fails the course.</p> <p>It should be NOTED that in cases when a student is excused for 30% of the scheduled class sessions or more, he or she has to study material provided under the course on their own. Course instructor might provide additional opportunities to submit missed graded pieces of work during office hours or conduct alternative assessment exercises using method of his or her choosing.</p> <p>Preparation for Class: Class participation is a very important part of the learning process in this course. Although not explicitly grade, students will be evaluated on the QUALITY of their contributions and insights. Quality comments possess one or more of the following</p>

properties:

- Offers a different and unique, but relevant, perspective;
- Contributes to moving the discussion and analysis forward;
- Builds on other comments.

Class work: The duration of each lecture and practical lesson is 50 minutes for offline class, and 40 minutes for online class. Students are expected to complete all readings and assignments ahead of time, attend class regularly and participate in class discussions. In case of systemic student's misconduct, the student can be dispensed from the classes.

Being late on class: When students come to class late, it can disrupt the flow of a lecture or discussion, distract other students, impede learning, and generally erode class morale. Moreover, if left unchecked, lateness can become chronic and spread throughout the class. Therefore, the being late to the class is not welcome and can have restriction activities by the course instructor. By the policy of this course, students who come late to class for more than 5 minutes are now allowed to get in to class and consequently, they will be marked as "absent" for the specific hour.

Attestation I and II: Students, who score less than 25% for Attestation period I or Attestation period II (RK1/RK2) automatically fail the course.

Home work / Assignments: The assignments are designed to acquaint students with the theoretical knowledge and practical skills required for the course. The textbook readings will be supplemented with materials collected from recent professional articles and journals. In case of using someone's work (papers, articles, any publications), all works must be properly cited. Failure to cite work will be resulted as a cheating from the students and may be a subject of additional disciplinary measures.

Late submissions: Most assignments will be discussed in class on the due date. It is expected that all work will be submitted on time. Failure to pass assignment on time will result in 0% for the assignment. All gradings are based using a percentage grading scale.

In the case of some extraordinary event, students should notify the course instructor and request an extension of the deadline for submission. If approved, a new date will be given to the student depending upon the circumstances by the instructor.

Final exam: Final Quiz.

Laptops and mobile devices can only be used for classroom purposes when directed by the course instructor. Misuse of laptops or handheld devices will be considered a breach of discipline and appropriate action will be initiated by the instructor.

Online lessons can be used in case if there won't be a chance to make offline traditional lessons. It must not discourage the interest and

	<p>enthusiasm of students. The main software to run the online lessons is Microsoft Teams for video calls and live webinars, and Moodle (moodle.astanait.edu.kz) as a Learning Management System. Also, some alternatives such as Telegram, Zoom, or other messenger may be involved as an additional workaround.</p> <p>Cheating and plagiarism are defined in the Academic conduct policies of the university and include:</p> <ol style="list-style-type: none"> 1. Submitting work that is not your own papers, assignments, or exams; 2. Copying ideas, words, or graphics from a published or unpublished source without appropriate citation; 3. Submitting or using falsified data; 4. Submitting the same work for credit in two courses without prior consent of both instructors. <p>Any student who is found cheating or plagiarizing on any work for this course will receive 0 (zero) for that work and further actions will also be taken regarding academic conduct policies of the university.</p> <p>Academic Conduct Policies of the university: The full texts of all the academic conduct code will be posted to the students using Learning Management System (moodle.astanait.edu.kz).</p> <p>Contacting the Course instructor: The easiest and most reliable way to get in touch with the course instructor is by email. Students must feel free to send email if you have a question related to the course. Instructor responds as soon as they can but not always instantaneously (on next workday). Instructor responds only on worktime: from Monday to Friday and from 9 am to 6pm. Instructor may not respond if request was answered once before or not related to education process, for example, request not planned by this course's syllabus additional tasks. Besides that, students are also welcomed to arrange a one-to-one meeting with the instructor by their office during office hours to discuss the class using both offline and online.</p>
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3. Course Content

#	Abbreviation	Meaning
1	ISIS	Instructor-supervised independent work
2	SIS	Students' independent work
3	IP	Individual project
4	PA	Practical assignment
5	LW	Laboratory work
6	MCQ	Multiple choice quiz

3.1 Lecture, Practical/Seminar/Laboratory Session Plans

Week No	Course Topic	Lectures (H/W)	Practice sessions (H/W)	Lab. sessions (H/W)	TSIS (H/W)	SIS (H/W)

1	First steps in Python, input, output, variables and data types, arithmetic operators, comparison operators	2	1	2	1	9
2	Conditional statement, logical operators, while loop, for loop, strings	2	1	2	1	9
3	Lists, tuples, sets, dictionaries	2	1	2	1	9
4	OS module, working with files, CSV module, JSON module	2	1	2	1	9
5	Functions, arguments, (lambda, map, filter), recursion, exception handling	2	1	2	1	9
6	Introduction to OOP, classes and objects	2	1	2	1	9
7	Inheritance, association, polymorphism	2	1	2	1	9
8	Modules, import methods, packages, unit tests	2	1	2	1	9
9	Decorators, Iterator, Generator, Regular Expressions	2	1	2	1	9
10	Applying Python skills to a real-world project	2	1	2	1	9
	Total hours: 150	20	10	20	10	90

3.2 List of Assignments for Student Independent Study

№	Assignments (topics) for Independent study	Hours	Recommended literature and other sources (links)	Form of submission
1	2	3	4	5
	Libraries for Game Development (Pygame, tkinter , etc)	9	Reading list, books, internet resources Electronic version	Reading list, books, internet resources Electronic version
2	Mathematical operations in Python ()	9	Reading list, books, internet resources Electronic version	Reading list, books, internet resources Electronic version
3	Libraries for data analysis (pandas) and data visualisation (matplotlib, seaborn)	9	Reading list, books, internet resources Electronic version	Reading list, books, internet resources Electronic version
4	Libraries for web app(Flask)	9	Reading list, books, internet resources Electronic version	Reading list, books, internet resources Electronic version
5	Libraries for UI (PyQt)	9	Reading list, books, internet resources Electronic version	Reading list, books, internet resources Electronic version
6	OOP in python	9	Reading list, books, internet resources	Reading list, books, internet

			Electronic version	resources Electronic version
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4. Student Performance Evaluation System for the Course

Period	Assignments	Number of points	Total
1 st attestation	Assignments**: Assignment 1, Assignment 2 Mid Term Quiz Practical exam	60 30 30 40 16 24	100
2 nd attestation	Assignments**: assignment 3, assignment 4, End Term (Project defense)	60 30 30 40	100
Final exam*	Quiz (MCQ)		100
Total	0,3 * 1st Att + 0,3 * 2nd Att + 0,4*Final		100

Achievement level as per course curriculum shall be assessed according to the evaluation chart adopted by the academic credit system.

Letter Grade	Numerical equivalent	Percentage	Grade according to the traditional system
A	4,0	95-100	Excellent
A-	3,67	90-94	
B+	3,33	85-89	
B	3,0	80-84	Good
B-	2,67	75-79	
C+	2,33	70-74	
C	2,0	65-69	
C-	1,67	60-64	Satisfactory
D+	1,33	55-59	
D	1,0	50-54	
FX	0	25-49	
F	0	0-24	Fail

Based on the specific grade for each assignment, and the final grade, following criteria must be satisfied:

Grade	Criteria to be satisfied
90-100	- Work would be worthy of further dissemination under appropriate conditions - Mastery of advanced methods and techniques at a level beyond that explicitly taught - Ability to synthesize and employ in an original way idea from across the subject - Outstanding command of critical analysis and judgment

80-89	<ul style="list-style-type: none"> - Excellent range and depth of attainment of intended outcomes - Mastery of a wide range of methods and techniques - Evidence of study and originality of what has been taught - Able to display a command of critical analysis and judgement
70-79	<ul style="list-style-type: none"> - Attained all the intended learning outcomes for a unit - Able to use well a range of methods and techniques to come to conclusions - Able to employ critical analysis and judgement
60-69	<ul style="list-style-type: none"> - Some limitations in attainment of learning objectives, but has managed to grasp most of them - Able to use most of the methods and techniques taught - Evidence of study and comprehension of what has been taught but grasp insecure - Some grasp of the issues and concepts underlying the techniques and material taught, but weak and incomplete
50-59	<ul style="list-style-type: none"> - Attainment of only a minority of the learning outcomes - Able to demonstrate a clear but limited use of some of the basic methods and techniques taught - Weak and incomplete grasp of what has been taught - Deficient understanding of the issues and concepts underlying the techniques and material taught
25-49	<ul style="list-style-type: none"> - Attainment of nearly all the intended learning outcomes deficient - Lack of ability to use at all or the right methods and techniques taught - Inadequately and incoherently presented - Wholly deficient grasp of what has been taught - Lack of understanding of the issues and concepts underlying the techniques and material taught
0-24	<ul style="list-style-type: none"> -No significant assessable material, absent or assessment missing a must pass component -The program code does not compile or the program does not work, i.e. does not read input or output correct result, or throw errors on execution. In such cases, a final grade of 0 is awarded.

5. Methodological Guidelines

Assessment is administered continuously throughout the course. The students are rated against their performance in continuous rating administered throughout the semester (60%) and summative rating done during the examination session (40%), total 100%. Continuous rating is students' on-going performance in class and independent work. Class work is assessed for attendance, laboratory works' defense and in- class assessments.

- **ISIS (Instructor Supervised Student Independent Study)** -comprises presentation to be done by students independently and checked by instructor.
- **Mid-term and End-term** is a review of the topics covered and assessment of each student's knowledge. The form of the midterm and end term exams is complex.
- **Final assessment** is a combination of both quiz and written exam to evaluate the student's academic performance and professional skills.

6. Lecturer (lecturers) approvals Full name Job title Date Sign

Full name	Job title	Date	Sign
Ramazanova Zamart	Senior-lecturer	26/11/2024	
Kutpanova Zarina	Senior-lecturer	26/11/2024	

Nurlankyzy Aisulu	Teacher	26/11/2024	
Akhmetov Tolegen	Senior-lecturer	26/11/2024	
Talapiden Kulyash	Teacher	26/11/2024	
Tutkyshbaeva Sh	Senior-lecturer	26/11/2024	
Maksutov Akylbek	Teacher	26/11/2024	
Salkenov Aldiyar	Senior-lecturer	26/11/2024	
Aidarbek Ansar		26/11/2024	

**Director of Department of
Computer Engineering**

Praveen Kumar