JSC «Kazakh-British Technical University»
Faculty of Information Technology
Chair of Information Systems Management

APPROVED BY
Dean of FIT
Bisembayev A.S.
« 17 » 02 2022

SYLLABUS

Discipline: Programming Principles 2
Number of credits: 4 (2/0/2)
Term: Spring 2022
Instructor's full name:

Personal Information about the Instructor	Time and place of classes		Contact information
	Lessons	Office Hours	e-mail
Beisenbek M. Baisakov	According to the schedule	According to the schedule	b.baisakov@kbtu.kz
Askar K. Akshabayev	According to the schedule	According to the schedule	a.akshabaev@kbtu.kz

Course duration: 4 credits, 15 weeks (60 class hours)
Course prerequisites: Programming Principles I

Course Description:

Objective of this course is to teach students how to use basic programming principles for creating console and desktop applications. This course uses Python as the main programming language. The course will teach students how to use Python core libraries like IO, Pygame, Serialization, Forms, Database and etc. to create applications. Students who successfully pass this course may expect to acquire firm grasp on programming principles.

Course Goals, Learning Outcome(s) and Outline:

- Learn the fundamentals of Python
- Work with primitive types and expressions
- Work with non-primitive types (classes, structs, arrays and enums)
- Learn the difference between value types and reference types
- Control the flow of programs using conditional statements
- Use arrays and lists

- Work with files and directories
- Work with text
- Work with date and time
- Debug Python applications effectively
- Understand the problems with inheritance and how composition solves these problems
- Learn how to create Graphical User Interface Elements

Methodology:
Class discussion, class assignments, A/V presentation, real-life experience, classroom exercises, and self-study.
Materials:

Python documentation - https://docs.python.org/
Pygame documentation - https://www.pygame.org/docs/
RabbitMQ - https://www.rabbitmq.com/

COURSE CALENDAR

	Class work	
	Topic	Seminars and TSIS
1	**L1. Course introduction and review.** Introduction to Python language. Python fundamentals. Git.	TSIS 1
2	**L2. Input/output (I/O).** Accessing OS resources: File System. OOP introduction.	TSIS 2
3	**L3. Python collections. Directories and files.** Lists, tuples, etc. Browsing directories and files.	TSIS 3
4	**L4. Serialization and Deserialization.** XML serialization. JSON serialization. Serialization of class, dictionary to JSON.	TSIS 4
5.	**L5. Regex in Python** Using Regex to search and match string patterns in text.	TSIS 5
6	**L6. Python builtin functions.** Builtin function of python.	TSIS 6
7	**Q1. Quiz** Quiz that covers topics discussed in first 6 weeks. 1st half of students	
8	**Q1. Quiz** Quiz that covers topics discussed in first 6 weeks. 2nd half of students	
9	**L7. Pygame introduction.**	TSIS 7

	Installing and using virtualenv. Pygame introduction. Drawing shapes	
10	**L8. Alpha blending in Pygame. Movement** Blending modes in pygame. Time-based and frame based movement.	TSIS 8
11	**L9. Tile-based graphics. Rotations and zoom** Escape the maze game. Rotating and zooming objects in pygame	TSIS 9
12	**L10. Collision detection.** Physics and inheritance. Shooting, bullet collisions and calculating trajectory.	TSIS 10
13	**L11. Databases** Saving data to database. Reading from database. Updating and deleting data in database.	TSIS 11
14	**L12. Network layer and brokers. RabbitMQ** Introduction to RabbitMQ. Message broker. Message producer. Message consumers. Queues and exchanges.	TSIS 12
15	**L13. Project defense preparation and course review** Preparing project defense. Environment setup. Course review.	
16	**Project defense.** Test questions.	

COURSE ASSESSMENT PARAMETERS

Type of activity	Final scores
Quizzes	80%
TSIS	0%
Final exam	20%
Total	**100%**

Criteria for evaluation of students during semester:

	Assessment criteria	Weeks															Total scores
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1.	Quizzes				*				*				*			*		80%
2.	TSIS	*	*	*		*	*	*		*	*	*		*	*			0%
3.	Final exam																*	20%
	Total																	100%

Academic Policy

KBTU standard academic policy is used.

- Cheating, duplication, falsification of data, plagiarism, and crib are not permitted under any circumstances!
- Attendance is mandatory.

Attention. Missing 20% attendance to lessons, students will be taken from discipline with filling in F (Fail) grade.

Students must participate fully in every class. While attendance is crucial, merely being in class does not constitute "participation". Participation means reading the assigned materials, coming to class prepared to ask questions and engage in discussion.

- Students are expected to take an active role in learning.
- Written assignments (independent work) must be typewritten or written legibly and be handed in time specified. Late papers are not accepted!
- Students must arrive to class on time.
- Students are to take responsibility for making up any work missed.
- Make up tests in case of absence will not normally be allowed.
- Mobile phones must always be switched off in class.
- Students should always be appropriately dressed (in a formal/semi-formal style).
- Students should always show tolerance, consideration and mutual support towards other students.