1. Course Code

2203

2. Course Title

F30e: Fundamentals of Computer Programming Python

3. Teacher

HAMIDULLAH, Sokout

4. Term

Fall 2

5. Course Requirements (Courses / Knowledge for this course) and Important Information

Fundamentals of Computer Systems (both courses can be taken concurrently)

6. Course Overview and Objectives

Programming is the foundation of every other subject in ICT. By becoming proficient in programming, students will be able to actively participate in projects involving system creation. Programming is also necessary for testing ideas, constructing and maintaining networks and servers, and in many other areas.
The course first reviews the fundamentals of procedural programming through experimental exploration, using the dynamic, interactive, object-oriented Python language. This course is the pave for Data Science and AI.

7. Course Outline

1. Course orientation, Python Objects and Data Structure Basics
2. Python Data Structure Advanced
3. Python Statements
4. Exercises
5. File Handling
6. Methods and Functions
7. Project-1
8. Exercises
9. Object Oriented Programming
10. Exercises
11. Errors and Exceptions Handling + Web Scraping
12. Python Database (MySQL)
13. Python Modules (Pandas, Numpy, Scipy) + Gradio
14. Exercises
15. Student Final Project
16. Presentation/ Reflection

8. Textbooks (Required Books for this course)

None.

9. Reference Books (optional books for further study)

Python Crash Course, 2nd Edition: A Hands-On, Project-Based Introduction to Programming
Author: Eric Matthes
Publisher: No Starch Press
Online Resources

10. Course Goals (Attainment Targets)

(1) Become able to read, understand, and modify programs written in Python.
(2) Become able to develop a small application.
(3) Can write and use Python scripts for everyday tasks.
(4)
(5)
(6)
(7)
(8)

11. Correspondence relationship between Educational goals and Course goals

Educational goals of the school			Course Goals
High level ICT skills	Basic academic skills		(1) (2) (3)
	Specialized knowledge and literacy		(2) (3)
Human skill (Tankyu skill)	Ability to continually improve own strengths		(3)
	Ability to discover and resolve the problem in society	Problem setting	
		Hypothesis planning	
		Hypothesis testing	
		Practice	
	Fundamental Competencies for Working Persons	Ability to step forward	(3)
		Ability to think through	(3)
		Ability to work in a team	
Professional ethics			

12. Evaluation

Goals	Evaluation method & point allocation					
	examination	Quiz	Reports	Presentation	Deliverables	Other
(1)		○				
(2)		○				
(3)				○	○	
(4)						
(5)						
(6)						
(7)						
(8)						
Allocation		20		30	50	

13. Evaluation Criteria

Examination	
Quiz	Related weeks tasks will be given to students to solve in order to evaluate the understanding of students and motivate them for further learning. Expected codes should be without errors and original.
Reports	
Presentation	In the final presentation, students will be asked develope a small application using Python. The evaluation will be based on participation in the group work, presentation, the relavance of the argument, time managment and relation to the course contents. Meanwhile, its recommended to have specific instructions for code implementation.
Deliverables	1. Individuale or group assignment will be assigned for the students with focus on learning goals (1,2 and 3). The evaluation will be based on how the students understand the exercises and participation. 2. The results required by the exercise can be achieved.
Other	

14. Active Learning

Hourly percentage of active learning within the whole class time		60%
1	Active learning such as problem solving assignment using the knowledge and skills acquired in class.	Sometimes
2	Active learning such as group works and discussions.	All the time
3	Outcome presentations and feedbacks.	All the time
4	Students actively make decisions on how the class should be conducted.	Not at all

15. Notes

16. Course plan

(Notice) This plan is tentative and might be changed at the time of delivery

Lesson 1: Python Objects and Data Structure Basics **Lecture + Exercises**

What is programming? We consider solving everyday tasks, first by natural language, then by writing exact and detailed instructions. Students learn the basics of the Python language through a few simple exercises and use it to test their understanding of the elements of programming principles.

Lesson 2: Python Data Structure Advanced **Lecture + Exercises**

1. List
2. Dictionary
3. Tuple
4. Set

Lesson 3: Python Statements **Lecture + Exercises**

1. If statements
2. Loop

Lesson 4: Exercises **Lecture + Exercises**

Summarize the previous knowledge and practice comprehensively.

Lesson 5: File Handling **Lecture + Exercises**

Introdcue the additional built-in sequence types, Dictionaries and Sets in Python.

Lesson 6: Methods and Functions **Lecture + Exercises**

1. Built in Methods in Python
2. User define Methods

Lesson 7: Project-1 **Exercises**

Summarize the previous knowledge and practice comprehensively.

Lesson 8: Exercises **Exercises**

Summarize the previous knowledge and practice comprehensively.

Lesson 9: Object Oriented Programming **Lecture + Exercises**

Introduce the the concept of Object Oriented Programming.

Lesson 10: Exercises **Exercises**

Summarize the previous knowledge and practice comprehensively.

Lesson 11: Errors and Exceptions Handling + Web Scraping **Lecture + Exercises**

1. Errors and Exeptions Handling with Python

Lesson 12: Python Database (MySQL) **Lecture + Exercises**

Learn how to use the Python library to connect to database, and operate the data in Python.

Lesson 13:Python Modules (Pandas, Numpy, Scipy) + Gradio **Lecture + Exercises**

Introduce the fundamental packages for scientific computing with Python: Numpy, Pandas Scipy and matplotlib and Gradio for user interface.

Lesson 14: Exercises **Exercises**

Summarize the previous knowledge and practice comprehensively.

Lesson 15-16: Final Presentation/ Reflection **Presentation**

Presentation and discussion