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) + Python Modules
13	Python GUI (Django + Gradio)
14	Exercises
15	Student Final Project
16	Presentation/ Reflection

8. Textbooks (Required Books for this course)

For this course, we prefer to use Jupyter Notebook. Jupyter Notebook Server available in case students have any difficulties with their own PCs

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		30		30	40	

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. Individual 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 2. Web Scaping concept and implementation 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. Introduce the fundamental packages for scientific computing with Python: Numpy, and Pandas.	

Lesson 13:Python GUI (Django + Gradio)	Lecture + Exercises
Intoducing the Graphical User Interface Framework with Python. The most common frameworks (Django) will be discussed, as well as Gradio which is an open source python package that can be used to quickly build a demo or web application for AI based solutions	
Lesson 14: Exercises	Exercises
Summarize the previous knowledge and practice comprehensively.	
Lesson 15-16: Final Project Presentation/ Reflection	Presentation
Presentation and discussion	