



# Course Specification

## — (Bachelor)

Course Title: **Problem Solving and Programming**

Course Code: **APIS1202**

Program: **Diploma in Information Security**

Department: **Diplomas**

College: **Applied College**

Institution: **Umm Al-Qura University**

Version: **1**

Last Revision Date: **14/12/2024**



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## A. General information about the course:

### 1. Course Identification

1. Credit hours: ( 3 )

#### 2. Course type

A. ☐ University ☐ College ☒ Department ☐ Track ☐ Others  
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: ( level 2, 1<sup>st</sup> year)

#### 4. Course general Description:

This course introduces the basic concepts of computer programming to students with some problem-solving skills. Students will be using Python, a high-level programming language, to learn the fundamentals of computer programming including how to write, compile, and run programs in an IDE. Topics include algorithms and problem solving, variables and data types, methods, console input/output, control structures, arrays, Python best coding styles, and the mechanics of running, testing, and debugging.

5. Pre-requirements for this course (if any):

6. Pre-requirements for this course (if any):

#### 7. Course Main Objective(s):

To equip students with the fundamental knowledge and skill to solve computational problems using a using Python programming language.

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>		
4	Distance learning		

### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		60

### B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Basic understanding of the Python programming language	K1	Course lectures, project	Quizzes, Midterm Exam, Final Exam
1.2	Understand and use basic control structures	K1	Course lectures, lab exercises, project	Quizzes, Midterm Exam, Final Exam
1.3	Understand and use arrays, vectors, and hash tables	K1	Course lectures, lab exercises, project	Quizzes, Midterm Exam, Final Exam
2.0	Skills			
2.1	Write Python programs that solve simple problems	S1	Lab coursework Project	Quizzes, Midterm Exam, Final Exam, project
2.2	Design simple programs using computing structures such as loops, conditions and functions	S2	Lab coursework Project	Quizzes, Midterm Exam, Final Exam, project
2.3	Using computer machines and software tools to solve computer problems	S2	Lab coursework Project	Quizzes, Midterm Exam, Final Exam, project



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			
3.1	Work in a group	V4	Project	Project

## C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to programming write , compile and run hello world program, introduce the IDE features	3
2.	Programming basics: input, output ,variables, data types, assignment statements, constants, data type conversions, arithmetic expressions	9
3.	Selection structure (if, if-else, and switch-case)	6
4.	Repetition structure (for, while, and do-while)	12
5.	Methods (arguments/parameters, call by-value/reference, method signature, and return statements)	6
6.	Arrays and lists	12
7.	Use python to write OS Scripts	12
		60

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	1 - 15	10%
2.	Labs	1 - 15	15%
3.	Project	1 - 15	20%
4.	Midterm	1 - 15	20%
5.	Final Exam	Finals Week	35%

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

Essential References	Introduction to Python Programming and Data Structures, 3rd edition Published by Pearson (July 25, 2022) © 2023 Y Daniel Liang
Supportive References	•
Electronic Materials	Umm Al Qura e-learning system containing teaching resources (Slides, assignment papers, etc.)



Other Learning Materials N/A

## 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture room with: * at least 30 seats * A data show projector connected to a PC preferably with Internet connection * sliding board * PC Lab (at least 30 seats)
<b>Technology equipment</b> (projector, smart board, software)	30 Linux/Windows PCs
<b>Other equipment</b> (depending on the nature of the specialty)	A maintenance lab + A PC lab with various operating systems such as Linux windows etc.

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of Students' assessment	Peers	Direct
Quality of learning resources	Quality Assurance Committee/ Curriculum Committee	Direct
The extent to which CLOs have been achieved	Instructor	Direct
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	Umm Al-Qura University Council
<b>REFERENCE NO.</b>	851141114462/190358
<b>DATE</b>	1446/11/22

