STUDENT GUIDE

MODULE : INTRODUCTION TO PROGRAMMING

COURSE : DICT/DNDFC

CODE : ITGP2008\V1.0G4

July 2020

INTRODUCTION

The module introduces the techniques and concepts of programming language. Participants are taught problem-solving skills using structured and object-oriented approached.

MODULE OBJECTIVES

At the end of the module, participants should be able to:

1. Understand fundamentals of programming such as variables, conditional and iterative execution, method.
2. Understand fundamentals of object-oriented programming.
3. Be able to create, debug and run computer program, and use them to solve specified problems.
4. Be able to work as a team in a group project

CONTENTS

Text:

Gaddis, T., 2018. Starting out with Python. 4th edition. Pearson Publishing.

ASSESSMENT

The assessment for this module is as follows:

1.	Quiz 1	20%
2.	Quiz 2	20%
3.	Practical Assessment	20%
4.	Team Project	40%
Total		**100%**

TOPIC 1
FUNDAMENTALS OF PROGRAMMING

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Describe the main hardware components of the computer and type of software
2. Explain how data is stored in a computer
3. Understand the basic of CPU operations and machine language
4. Understand the fetch-decode-execute cycle, program development cycle, tools for program design, and the design process

TOPICS

1. Introduction
2. Hardware and Software
3. How Computers Store Data
4. How a Program Works
5. Setup & Using Integrated Development Environment (IDE)

TOPIC 2
VARIABLES AND DATA TYPES, OPERATORS AND EXPRESSIONS

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Understand ways in which programs can receive input, present and format output
2. Uses of variables, named constants and comments in programs
3. Identify tools for performing calculations in programs

TOPICS

1. Designing a Program
2. Input, Processing, and Output
3. Displaying Output with print Function
4. Comments
5. Variables
6. Reading Input from the Keyboard
7. Performing Calculations
8. More About Data Output
9. Named Constants

TOPIC 3
BOOLEAN VALUES

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Understand the purpose of using conditional statement
2. List down different type logical operators
3. Identify Boolean variables

TOPICS

1. The if Statement
2. The if-else Statement
3. Comparing Strings
4. Nested Decision Structures and the if-elif-else Statement
5. Logical Operators
6. Boolean Variables

TOPIC 4
CONTROL STRUCTURES

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Understand the fundamental concept of repetition structure and loop.
2. List down different type of loops
3. Develop a simple application using conditional-controlled and count-controlled loop

TOPICS

1. Introduction to Repetition Structures
2. The while Loop: a Condition-Controlled Loop
3. The for Loop: a Count-Controlled Loop
4. Calculating a Running Total
5. Sentinels
6. Input Validation Loops
7. Nested Loops

TOPIC 5
FUNCTIONS, TUPLES, DICTIONARIES AND DATA

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Understand the fundamental and syntax for defining and calling a function
2. Use of local variables and their scope, global variables, and global constants
3. Understand data management and manipulation technique using list and tuple
4. Explore and using library functions and the import statement

TOPICS

1. Introduction to Functions
2. Defining and Calling a Void Function
3. Designing a Program to Use Functions
4. Local Variables
5. Passing Arguments to Functions
6. Global Variables and Global Constants
7. Storing Functions in Modules
8. Introduction to Sequences, Lists & Tuple
9. List Slicing, Copy, and Processing
10. Finding Items in Lists with the in Operator
11. Two-Dimensional Lists

TOPIC 6
DATA STRUCTURE, AND COLLECTIONS

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Understand the fundamental of Data Structure
2. Explore and Manipulating Collections

TOPICS

1. Sequences
2. Introduction to Lists
3. List Slicing
4. Manipulating and Process List
5. Two Dimension List
6. Tuples

TOPIC 7
MORE ABOUT STRINGS

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Understand basic String Operation

3. Uses string operator to test, search and manipulate strings

TOPICS

1. Basic String Operations

2. String Slicing

3. Testing, Searching and Manipulating Strings

TOPIC 8
FILE IO, AND EXCEPTION

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Identify types of files and file access methods
2. Explain the needs of exception with an application

TOPICS

1. Introduction to File Input and Output
2. Using Loops to Process Files
3. Processing Records
4. Exceptions

TOPIC 9
OBJECT-ORIENTATED CONCEPTS AND PROGRAMMING

LEARNING OBJECTIVES

At the end of the topic, you should be able to:

1. Explain the different between Procedural Programming and OOP
2. Understand the techniques for designing classes

TOPICS

1. Procedural and Object-Oriented Programming
2. Classes
3. Working with Instances
4. Techniques for Designing Classes