# **Course Details**

|  |  |  |
| --- | --- | --- |
| **Chapter** | **Details** | **Duration** |
| **1** | **Chapter 1. Programming Basic Concept and Starting Python** | **19H**  **(total)** |
| [Objective] Learners configure a practice environment for Python and learn the basics of programming and become familiar with the foundations of Python, such as input/output, data types, and variables. |
| Unit 1. Sequential Programming | 2H |
| Unit 2. Planning for Programming | 2H |
| Unit 3. Basic of Numeric Data Types and Arithmetic Operation | 2H |
| Unit 4. Variables and Inputs | 2H |
| Unit 5. Logic and Comparison Operations | 2H |
| Unit 6. Conditional Statement 1: Conditions and Decision Making | 2H |
| Unit 7. Conditional Statement 2: Making Decisions in Two-Direction and Applying Conditional Statements | 2H |
| Unit 8. Loop 1 | 2H |
| Unit 9. Loop 2 | 2H |
| Quiz | 1H |
| **2** | **Chapter 2. Python Programming Basic - Sequence Data Type in Python** | **15H**  **(total)** |
| [Objective] Learners use sequence types in Python, such as list, dictionary, tuple, and set, and learn the data structure of Python. |
| Unit 1. Lists and Tuple Data Types | 2H |
| Unit 2. Dictionary Data Types | 2H |
| Unit 3. Addressing Sequence Types | 2H |
| Unit 4. Two-Dimensional List | 2H |
| Unit 5. Dictionary Method 1 | 2H |
| Unit 6. Dictionary Method 2 | 2H |
| Unit 7. Set Data Types | 2H |
| Quiz | 1H |
| **3** | **Chapter 3. Effective Python Programming - Function, Closure, and Class** | **11H**  **(total)** |
| [Objective] Learners use functions, modular programming techniques, and lambda expressions. They understand the closure that receives the return value as a function and define classes, which are important concepts of object-oriented languages. |
| Unit 1. Function | 2H |
| Unit 2. Recursion Function Call | 2H |
| Unit 3. Lambda | 2H |
| Unit 4. Closure | 2H |
| Unit 5. Class | 2H |
| Quiz | 1H |
| **4** | **Chapter 4. Algorithm 1 - Data Structures** | **11H**  **(total)** |
| [Objective] Learners understand the concept of data structures, define, and apply abstract data types, including stack, queue, and hash table. They understand linear search and binary search to solve search problems. |
| Unit 1. Stack | 2H |
| Unit 2. Queue | 2H |
| Unit 3. Linear Search | 2H |
| Unit 4. Binary Search | 2H |
| Unit 5. Hash Table | 2H |
| Quiz | 1H |
| **5** | **Chapter 5. Algorithm 2 - Sorting Algorithms** | **7H**  **(total)** |
| [Objective] Learners understand sorting problems and solve sorting problems using bubble sort, selection sort, insertion sort, merge sort, and quick sort methods. In addition, the sorting algorithm can be implemented in Python, and learners understand and compare each sorting method’s time complexity. |
| Unit 1. Bubble, Selection, and Insertion Sort | 2H |
| Unit 2. Merge Sort | 2H |
| Unit 3. Quick Sort | 2H |
| Quiz | 1H |
| **6** | **Chapter 6. Algorithm 3 - Problem Solving with Algorithms** | **9H**  **(total)** |
| [Objective] Learners understand algorithmic design techniques, such as the greedy approach, divide-and-conquer method, dynamic planning method, and backtracking, and apply them to actual problems in order to solve them. |
| Unit 1. Greedy Approach | 2H |
| Unit 2. Divide-and-Conquer | 2H |
| Unit 3. Dynamic Programming | 2H |
| Unit 4. Backtracking | 2H |
| Quiz | 1H |
| **7** | **Chapter 7. Data Processing, Descriptive Statistics, and Data Visualization** | **11H**  **(total)** |
| [Objective] Learners collect large amounts of data in various forms and organize them in a form that can be analyzed, generate various descriptive statistics on the organized data using Pandas, and visualize data using the Python visualization library |
| Unit 1. Using Python Modules | 2H |
| Unit 2. Pandas Series for Data Processing | 2H |
| Unit 3. Pandas DataFrame for Data Processing | 2H |
| Unit 4. Data Tidying | 2H |
| Unit 5. Time Series Data | 2H |
| Quiz | 1H |
| **8** | **Chapter 8. Data Analysis and Visualization - Mini Project** | **5H**  **(total)** |
| [Objective] Learners understand that data analysis skills using Python are essential skills in the real field by solving real-world cases through the mini-project and practice in the field of financial accounting through financial data analysis tasks. |
| Unit 1. Financial Data Analysis Mini Project | 2H |
| Unit 2. Global Corona Pandemic Analysis Mini Project | 2H |
| Quiz | 1H |