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PROFESSIONAL

VERSION 6.0

CORE & ADVANCED PYTHON PROGRAMMER

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CORE & ADVANCED PYTHON PROGRAMMER

SR. CODE

EAPL/PROF/PRTC03

COURSE CODE

EAPAP

SUB CATEGORY

PROGRAMMING DEVELOPMENT

TOTAL DURATION	THEORY TAKEN	PRACTICAL TAKEN
90 HOURS	22 HOURS	68 HOURS

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COURSE DESCRIPTION

Introduction to programming basics (what it is and how it works), binary computation, problem-solving methods and algorithm development. Includes procedural and data abstractions, program design, debugging, testing, and documentation. Covers data types, control structures, functions, parameter passing, library functions, arrays, inheritance and object oriented design. Laboratory exercises in Python.

COURSE GOALS

Understand basic principles of computers
• Understand basics of binary computation
•Understand the programming basics (operations, control structures, data types, etc.)
•Readily use the Python programming language
•Apply various data types and control structure
•Understand class inheritance and polymorphism
•Understand the object-oriented program design and development
•Understand and begin to implement code

FUTURE SCOPE

A Python developer has a highly promising future. The entire planet is becoming digital. In terms of these technologies' success, Python has emerged as the language of choice. Let's explore the technologies that rely on Python as a fundamental building block for analysis, creation, and future

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Technology advancements like artificial intelligence (AI), machine and deep learning, the Internet of Things (IoT), etc. are made possible by this.

01 CHAPTER

01 HRS

03 HRS

1. Introduction To Script

1.1. What is Script, program?

1.2. Types of Scripts

1.3. Difference between Script and Programming Languages

1.4. Features and Limitation of Scripting

1.5. Types of programming Language Paradigms

2. Introduction To Python

2.1. What is Python?

2.2. Why Python?

2.3. Who Uses Python?

2.4. Characteristics of Python

2.5. What is PSF?

2.6. History of Python

2.7. Python Versions

2.8. How to Download and Install Python

2.9. Install Python with Diff IDEs

2.10. Features and Limitations of Python

2.11. Creating Your First Python Program Python Applications

2.12. Printing to the Screen

2.13. Reading Keyboard Input

2.14. Using Command Prompt and GUI or IDE

2.15. Python Distributions

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02 CHAPTER

01 HRS

03 HRS

1. Different Modes In Python

1.1. Execute the Script

1.2. Interactive and Script Mode

1.3. Python File Extensions

1.4. SETTING PATH IN Windows

1.5. Clear screen inside python

1.6. Learn Python Main Function

1.7. Python Comments

1.8. Quit the Python Shell

1.9. Shell as a Simple Calculator

1.10. Order of operations

1.11. Multiline Statements

1.12. Quotations in Python

1.13. Python Path Testing

1.14. Joining two lines

1.15. Python Implementation Alternatives

1.16. Sub Packages in Python

1.17. Uses of Python in Data Science, IoT

1.18. Working with Python in Unix/Linux/ Windows/Mac/Android..!!

2. Python New IDEs

2.1. PyCharm IDE

2.2. How to Work on PyCharm PyCharm Components

2.2. Debugging process in PyCharm PYTHON Install Anaconda

2.3. What is Anaconda? Coding Environments

2.4. Spyder Components General Spyder Features

2.5. Spyder Shortcut Keys

2.6. Jupyter Notebook

2.7. What is Conda? And Conda List?

2.8. Jupyter and Kernels

2.9. What is PIP?

03 CHAPTER

1. Variables in Python

01 HRS

05 HRS

1.1. What is Variable?

1.2. Variables and Constants in Python

1.3. Variable, Variable names and Value

1.4. Mnemonic Variable Names Values and Types

1.5. What Does "Type" Mean?

1.6. Multiple Assignment

1.7. Python different numerical types Standard Data Types

1.8. Operators and Operands

1.9. Order of Operations Swap variables

1.10. Python Mathematics Type Conversion

1.11. Mutable Versus Immutable Objects

2. Python Datatypes

2.1. What is a data type?

2.2. Types of Data types

2.3. Numbers

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04 CHAPTER

01 HRS

03 HRS

1. Dictionary

1.1. How to create a dictionary?

1.2. PYTHON HASHING? Python Dictionary Methods

1.3. Copying dictionary Updating Dictionary

1.4. Delete Keys from the dictionary Dictionary items() Method

1.5. Sorting the Dictionary Python Dictionary in-built Functions

1.6. Dictionary len() Method

1.7. Variable Types Python List cmp() Method

1.8. Dictionary Str(dict)

2. Set

2.1. How to create a set?

2.2. Iteration Over Sets Python Set Methods

2.3. Python Set Operations Union of sets

2.4. Built-in Functions with Set

2.5. Python Frozenset

3. Strings

3.1. What is string?

3.2. String operations and indices Basic String Operations

3.3. String Functions, Methods

3.4. Delete a string

3.5. String Multiplication and concatenation

3.6. Python Keywords, Identifiers and Literals

3.7. String Formatting Operator

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3.8. Structuring with indentation in Python

3.9. Built-in String Methods

05
CHAPTER

01 HRS

03 HRS

1. Python operators

1.1. Arithmetic, Relational Operators and Comparison Operators

1.2. Python Assignment Operators Short hand Assignment Operators

1.3. Logical Operators or Bitwise Operators Membership Operators

1.4. Identity Operators Operator precedence

1.5. Evaluating Expressions

2. Python Conditional Statements

2.1. How to use “if condition” in conditional structures

2.2. if statement (One-Way Decisions)

2.3. if .. else statement (Two-way Decisions)

2.4. How to use “else condition”

2.5. if .. elif .. else statement (Multi-way)

2.6. When “else condition” does not work

2.7. How to use “elif” condition

2.8. How to execute conditional statement with minimal code

2.9. Nested IF Statement

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06 CHAPTER

01 HRS
03 HRS

1. Operators

1.1. What is an operator?
1.2. Different type of operators
1.3. Arithmetic Operators
1.4. Assignment operator
1.5. Unary minus operator
1.6. Relational operators
1.7. Logical operators
1.8. Membership operators
1.9. Identity operators

2. Python LOOPS

2.1. How to use “While Loop” and “For Loop”
2.2. How to use For Loop for set of other things besides numbers
2.3. Break statements, Continue statement, Enumerate function for For Loop
2.4. Practical Example How to use for loop to repeat the same statement over and again
2.5. Break, continue statements

07 CHAPTER

01 HRS
03 HRS

1. Python Functions What is a function?

1.1. How to define and call a function in Python Types of Functions
1.2. Significance of Indentation (Space) in Python How Function Return Value?

1.3. Types of Arguments in Functions
1.4. Default Arguments and Non-Default Arguments
1.5. Keyword Argument and Non-keyword Arguments Arbitrary Arguments
1.6. Rules to define a function in Python
1.7. Various Forms of Function Arguments > Scope and Lifetime of variables
1.8. Nested Functions
1.9. Call By Value, Call by Reference
1.10. Anonymous Functions/Lambda functions
1.11. Passing functions to function
1.12. map(), filter(), reduce() functions
1.13. What is a Docstring?

2. Lambda Operator, Filter, Reduce and Map

2.1. Lambda function
2.2. Filter function
2.3. Reduce function
2.4. Map function

08 CHAPTER

1. List Comprehension

1.1. Introduction
1.2. Generator Comprehension
1.3. Set Comprehension

01 HRS
03 HRS

2. Modules

2.1. Importing module
2.2. Math module
2.3. Random module
2.4. Packages
2.5. Composition

3. Input-Output

3.1. Printing on screen
3.2. Reading data from keyboard
3.3. Opening and closing file
3.4. Reading and writing files
3.5. Functions

09
CHAPTER

1. Exception Handling

1.1. Exception
1.2. Exception Handling
1.3. Except clause
1.4. Try??? finally clause
1.5. User Defined Exceptions

1.5 HRS
03 HRS

2. Regular expressions

2.1. Match function
2.2. Search function
2.3. Matching VS Searching
2.4. Modifiers
2.5. Patterns

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10
CHAPTER

1.5 HRS

05 HRS

1. Packages

1.1. Predefined Packages

1.2. User Defined

2. Packages File Handling

2.1. Text Files

2.2. Binary Files

2.3. Zip and Unzip Files

2.4. Pickling

2.5. Unpickling

2.6. Reading Program from another Program In Command Prompt

3. File Handling

3.1. Python File Handling

3.2. Python Read Files

3.3. Python Write/Create Files

3.4. Python Delete Files

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CHAPTER

OBJECT ORIENTED PROGRAMMING

01 HRS

08 HRS

1. Constructor

1.1. What are Constructors

1.2. Is constructor mandatory in Python?

1.3. Can a constructor be called explicitly?

1.4. How many parameters can constructor have?

1.5. Parameterized and Non-Parameterized Constructors in Python

1.6. Difference between a method and constructor in Python

1.7. Difference between a method and a function

2. Types of Class variable

2.1. Types of Class Variables

2.2. Instance Variables

2.3. Where instance variables can be declared?

2.4. Accessing instance variables

2.5. Static Variables

2.6. Declaring static variables

2.7. Accessing a static variable

2.8. Local Variables

3. Types of Class Method

3.1. Types of Methods in a Class

3.2. Instance Methods

3.3. Setter and Getter methods

3.4. Class Methods

3.5. Static Methods

3.6. Nested Classes

3.7. Garbage Collection

4. Super function

4.1. Super() Function in Python

4.2. Which scenarios super () function is required?

4.3. Different Approaches for calling method of a specific super class.

4.4. Different cases for super () function

5. Polymorphism

5.1. Polymorphism

5.2. Types of Polymorphism

5.3. Overloading

5.4. Operator overloading

5.5. Method overloading

5.6. How we can handle overloaded method requirements

5.7. Constructor Overloading

5.8. Overriding

5.9. Method Overriding

5.10. Constructor Overriding

6. Abstract classes

6.1. What is an Abstract Class in Python?

6.2. Types of Methods in Python based on the Implementation

6.3. How to declare an abstract method in Python

6.4. Abstract Classes in Python

12 CHAPTER

EXCEPTION HANDLING & FILES

01 HRS
06 HRS

1. Exception Handling

1.1. Types of Error
1.2. Syntax and Runtime Errors
1.3. What is an Exception?
1.4. Exception Handling in Python

2. Finally Block

2.1. Why do we need Finally Block?
2.2. Finally Block in Python
2.3. Why not 'try except' block for clean-up activities?
2.4. Different control flow cases of try except finally in python

3. Nested try-except-finally blocks

3.1. Nested try-except-finally blocks in Python
3.2. Different cases and scenarios
3.3. Else Block in Python
3.4. Possible Combinations with try-except-else-finally

4. Files

4.1. What is a File?
4.2. Types of Files

4.3. File Modes
4.4. Opening and Closing a File
4.5. Properties of File Object
4.6. Writing data to a File
4.7. Reading data From a File
4.8. With Keyword

13 CHAPTER

MULTITHREADING

02 HRS
07 HRS

1. Introduction

1.1. What is Multitasking?
1.2. Process based and Thread based Multitasking
1.3. Applications of Multithreading
1.4. How to implement Multithreading?
1.5. Different Ways to Create a Thread
1.6. Creating a Thread using Thread class
1.7. Creating a Thread class by inheriting Thread class

2. Methods of Thread Class

2.1. active_count()
2.2. enumerate()
2.3. isAlive()
2.4. join()
2.5. join(seconds)

3. Synchronization

3.1. Synchronization

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3.2. How to implement synchronization?
3.3. Synchronization By using Lock concept
3.4. Synchronization By using RLock concept
3.5. Difference between Lock and RLock
3.6. Synchronization by using Semaphore
3.7. Bounded Semaphore

4. Inter Thread Communication

4.1. What is Inter Thread communication?
4.2. Inter Thread communication by using Event Objects
4.3. Inter Thread communication by using Condition Object
4.4. Inter Thread communication by using Queue in python
4.5. Types of Queues
4.6. FIFO Queue
4.7. LIFO Queue
4.8. Priority Queue

14 CHAPTER

BASE COMMUNICATION AND NETWORKING

02 HRS
05 HRS

1. Python XML Parser

1.1. What is XML?
1.2. Difference between XML and HTML and XML, JSON, Gson
1.3. How to Parse XML and Create XML Node www

1.4. Python vs JAVA

1.5. XML and HTML

2. Python-Data Base Communication

2.1. What is Database?

2.2. Types of Databases?

2.3. What is DBMS?, RDBMS?

2.4. What is Big Data?

2.5. Types of data?

2.6. Oracle MySQL

2.7. SQL server

2.8. DB2

2.9. Postgres SQL Executing the Queries

2.10. Bind Variables Installing of Oracle Python Modules

3. Unit Testing with PyUnit

3.1. What is testing?

3.2. Types of Testing and Methods?

3.3. What is Unit Testing?

3.4. What is PyUnit?

3.5. Test scenarios, Test Cases, Test suites

4. Networking

4.1. Socket

4.2. Socket Module

4.3. Methods

4.4. Client and server

4.5. Internet modules

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15 CHAPTER

PACKAGES

2.5 HRS

6.5 HRS

1. Numpy

1.1. Introduction to numpy
1.2. Creating arrays o Indexing Arrays
1.3. Array Transposition
1.4. Universal Array Function
1.5. Array Processing
1.6. Array Input and Output

2. Pandas

2.1. What are pandas?
2.2. Where it is used?
2.3. Series in pandas
2.4. Index objects
2.5. Reindex
2.6. Drop Entry
2.7. Selecting Entries
2.8. Data Alignment
2.9. Rank and Sort
2.10. Summary Statics
2.11. Index Hierarchy

3. Matplotlib

3.1. Data Visualization
3.2. Python for Data Visualization
3.3. Welcome to the Data Visualization Section
3.4. Introduction to Matplotlib

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CHAPTER 16

01 HRS

03 HRS

1. Data Science

1.1. What is Data Science?

1.2. Data Science Life Cycle?

1.3. What is Data Analysis, Data Mining

1.4. Analytics vs Data Science

2. Internet of Things

2.1. IMPACT OF THE INTERNET

2.2. What is IOT

2.3. History of IoT

2.4. What is Network, Protocol, smart?

2.5. How IoT Works?

2.6. The Future of IoT

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