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PROFESSIONAL

ELYSIUM ACADEMY MASTER IN PROGRAMMING LANGUAGE (CORE JAVA, CORE PYTHON)

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SR. CODE

EAPL/PROF/PRTC01

COURSE CODE

EAPMP

SUB CATEGORY

PROGRAMMING DEVELOPMENT

TOTAL DURATION	THEORY TAKEN	PRACTICAL TAKEN
90 HOURS	25 HOURS	65 HOURS

ELYSIUM ACADEMY MASTER IN PROGRAMMING LANGUAGE (CORE JAVA, CORE PYTHON)

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 HRS

03 HRS

01 CHAPTER

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

2.3. Debugging process in PyCharm PYTHON Install Anaconda

2.4. What is Anaconda? Coding Environments

2.5. Spyder Components General Spyder Features

2.6. Spyder Shortcut Keys

2.7. Jupyter Notebook

2.8. What is Conda? And Conda List?

2.9. Jupyter and Kernels

2.10. 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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CHAPTER 04

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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11 CHAPTER

BASICS OF JAVA

01 HRS

01 HRS

O1· Basics: Internal path setting

O2. Environment Setup:

a. ·Download Links

b·Method and Installation of Java on Windows

12 CHAPTER

DECLARATION OF JAVA

01 HRS

02 HRS

O1· Data Types

O2. Variables, Constraints, and Literals

a·Variable declaration

b·Initialization of Variable

c·Naming convention

d·Types of variables

e·Memory allocation of variables

O3· Operators

13 CHAPTER

CONTROL STATEMENTS

01 HRS

03 HRS

O1· Decision-Making Statements

a. IF-ELSE

b. Switch

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O2. Looping Statements

a. For loop

b. While loop

c. Do-while loop

O3. Jumping Statements

a. Break

b. Continue

14
CHAPTER

METHODS

O1. Methods in Java
O2· Use of method
O3· Method declaration
O4· Method signature
O5· Types of methods
O6· Calling of method
O7· Java main method
O8· Return type

30 mins
2.5 HRS

15
CHAPTER

OOPS & CONCEPTS

O1. Class

O2. Objects

O3. Constructor

a. Types of Constructor

03 HRS
10 HRS

b·Constructor Overloading

c· Copy Constructor

O4. Encapsulation

a.Definition

b·Data Hiding

c· Getter and setter method

d·The Naming convention for the Getter and Setter methods

O5. Inheritance

a.Definition

b·Is-A-Relationship

c· Types of Inheritance

d·Aggregation and Composition

O6. Polymorphism

a.· Definition

b·Types of polymorphism

c·Method Overloading

d·Method overriding

O7. Super and this Keyword

a. Definition

b·Super class Methods and Constructor

O8. Abstraction

a. Abstract class

c· Abstract method

O9. Interface

a. Nested interface, rules, and example programs

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16
CHAPTER

KEYWORD

30 mins

02 HRS

01. Keywords & Modifiers

a·Access modifier ad a non-access modifier

b·Types of access modifiers

c· Types of non-access modifiers

02. Static Keyword

a. ·Static variable

b·Static methods

c· The distinctions between a static variable and an instance variable

03. Final Keyword

a· Final variable

b· Final methods

c·Final class

04. Inner Class

a·Definition

b· Types

05. This Keyword

17
CHAPTER

EXCEPTION HANDLING

30 mins

1.5 HRS

01· ·Explanation

02· Try, Catch, Finally

03· Throw , Throws in Exception Handling

04· Throw vs. Throws

05· Final vs. Finally vs. Finalize

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18 CHAPTER

INPUT-OUTPUT STREAM

30 mins

01. I/O Stream
    a. Character Stream
    b. Byte Stream
02. File Class
03. Serialization

30 mins

19 CHAPTER

ARRAY AND STRINGS

30 mins

01. Array
    a. Definition
    b. Types of Array
    c. Array Programs
02. Sting, String Buffer, String Builder
    a. Definition
    b. Immutable String
    c. String Comparison
    d. String Concentration
    e. Substring
    f. String Buffer Class
    g. Strig Builder Class
    h. to String() method

30 mins

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20 CHAPTER

COLLECTIONS FRAMEWORK

30 mins | 03 HRS

O1. Definition
O2. Collections
O3. List types, set types.
O4. Comparable an Comparator Interface
O5. Generic
O6. Lambda Expressions
  a. Introduction to Lambda Expression
  b. Parameters in Lambda Expression
O7. Date and Time API
  a. Java time Classes
  b. Data Formatter
  c. Calendar and Time Zone

21 CHAPTER

THREAD

30 mins | 1.5 HRS

O1. Multithreading
O2. Multithreading life cycle
O3. Thread scheduler
O4. Calling method
O5. Joining a thread
O6. Naming a thread
O7. Thread priority
O8. Daemon thread
O9. Thread pool

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10· Thread Group
11· Shutdown hook
12. Java Synchronization
13· Deadlock
14· Inter-thread Communication
15· Interrupting Thread

22 CHAPTER

CHAPTER 12

01. Java Networking
a.Socket Programs

30 mins
01 HRS

23 CHAPTER

JDBC

01· JDBC Drivers
02· Connecting steps to Database
03· Oracle Connectivity
04· Connectivity with MySQL
05· Connectivity with Access without DSN
06· Driver Manager
07· Types of JDBC statements
08· Database Metadata, Resultset Metadata
09· ResultSet, types of ResultSet

01 HRS
4.5 HRS

10. Storing images, Retrieving image
11. Storing files, Retrieving files, Stored procedures, and functions
12. Transaction Management
13. Batch Processing

24 CHAPTER

SQL

30 mins

2.5 HRS

01. Data Query Language
- a. What is DQL?
- b. Purpose of DQL
- c. Select

02. Data Manipulation Language
- a. What is DML?
- b. Purpose of DML
- c. Insert data
- d. Update data
- e. Delete Data
- f. Lock data

03. Data Control Language
- a. What is DCL?
- b. Purpose of DCL
- c. Grant data
- d. Revoke data

04. Transaction Control Language
- a. What is TCL?
- b. Purpose of TCL
- c. COMMIT
- d. ROLLBACK
- e. SAVEPOINT

05. Inserting data
- a. Hands on INSERT data

b. SELECT
c. Hands on SELECT query
d. Multi inserts
e. Hands on Multi inserts
f. NOT NULL
g. Hands on NOT NULL
h. DEFAULT Values
i. Hands on DEFAULT Values
j. AUTO INCREAMENT
k. Hands on AUTO INCREAMENT

06· Basic Operators

a. ORDER BY
b. ALIASES
c. UNIONS
d. CONSTRAINTS
e. VIEWS

07· Primary Key

a. What is primary key?
b. Creating a primary key
c. Dropping a primary key

08· Foreign key

a. What is foreign key?
b. Creating a foreign key
c. Dropping a foreign key

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