FUTURE PROOF LEARNING - NEP ALIGNED
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CERTIFICATE IN PYTHON

DURATION: 60 Hours

TOTAL CREDITS: 2

COURSE SYLLABUS

Objective

The goal of this course is to introduce Python. The course will discuss topics necessary for the participant to be able to create and execute Python programs. The lectures and presentations are designed to provide knowledge and experiences to students that serve as a foundation for continued learning of presented areas

Exit Profile

- Install and run the Python interpreter
- Create and execute Python programs
- Understand the concepts of file I/O

Career Path

- Full-Stack Web Developer - Python
- Programmer in Python
- Python application developer
- Software developer
- Junior Programmer
- IT Educator

Course Outline

Course Name:	CERTIFICATE IN PYTHON	Duration:	60 H
Module	Topic	Dur.	Total Dur.
Module -1	Programming Concepts, Introduction to Python, Installation & Environment Set up Program creation and execution	3	30 H
	Decision Structures	6	
	Loops	6	
	Collection Data Types (List, Tuple, Dictionary, Set)	12	
	String Manipulation	3	
Module -2	Functions	12	30 H
	Object oriented programming: class, object & inheritance	12	
	File Manipulation	6	

Course in Detail

MODULE - 1:

INTRODUCTION TO PROGRAMMING & PYTHON INSTALLATION

- Overview of Programming Languages
  - Machine language
  - Assembly language
  - High level language
- Compilers & Interpreters
- History of python
  - Evolution of Python
  - Features of python
  - Applications of Python
- Installation & Environment Setup

BASICS OF PYTHON PROGRAMMING

- Introduction
- Python character set
- Tokens
- Values & types
- Variables
- Variable name & keyword
- Data Types: Int, float, complex Number, Boolean & string
- Data type conversion
- Multiple assignment to variables
- Input &Print Function
- Formatting Numbers & strings

OPERATORS & EXPRESSIONS

- Operators & operands, types
- Arithmetic Operators: Unary, Binary
- Comparison Operators
- Logical Operators: not, and, or
- Membership Operators

DECISION & LOOP CONTROL STATEMENTS

- Boolean Expression & relational operators
    - The if statement
    - The If-else statement
    - Nested if statement
    - Multi way if else statements
- Conditional Expressions
    - While Loop
    - Break statement
    - Continue statement
    - Nested loops
    - For loops
- Range Functions

LISTS

- List values
- Create, Accessing elements
- List length, membership
- List & for loops
- List operations
- List slices [Start:end]
- List deletion
- Object & values

- Passing list to a function
- Cloning lists
- Nested list

TUPLES, SET & DICTIONARIES

- Tuples
    - Introduction to tuples
    - Creating tuple
    - Tuple assignment
    - Operations on tuples
- Sets
    - Introduction
    - Set with List - operations
    - Set operations and functions
- Dictionaries
    - Basics of dictionaries
    - Creating a dictionary
    - Add, Replace, retrieve, format, delete items in a dictionary

STRING MANIPULATION

- Built-in string functions
- Pattern Searching
- Replacing and removing substrings
- Working with Slice Operator
- Applying Slice Operators in Lists and Tuples

MODULE - 2:

FUNCTIONS

- Introduction to Functions
- Parameters & arguments in a function

- Arguments
    - Positional arguments
    - Arguments with default values
- Function with return values
- Lambda Keyword
- Custom Libraries
- Custom Packages

EXCEPTIONS

- Introduction
- Try .. Except Blocks
- Try .. Except .. Else Blocks
- Try .. Except .. Finally Blocks
- Multiple Exception Handlers
- Nested Exception Handlers
- Raising Exceptions

OBJECT ORIENTED PROGRAMMING: CLASS, OBJECT & INHERITANCE

- Classes and objects
- Constructors
- Operator overloading
- Inheritance
- Multilevel, multiple inheritance
- Method overriding

FILES MANIPULATION

- Introduction
- Writing & Reading Text Files
- Writing & Reading Data Files
- Writing and Reading objects into binary

- Directory Manipulation