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## Python Programming 1

**Duration: 4 Days**    **Course Code: PYP1**

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### Overview:

Python is an object oriented rapid development language deployed in many scenarios in the modern world.

This Python Programming 1 course is designed to give delegates the knowledge to develop and maintain Python scripts using the current version (V3) of Python.

There are many similarities between Python V2 and Python V3. The skills gained on this course will allow the delegate to develop their own skills further using Python V2 or V3 to support the development and maintenance of scripts.

The Python Programming 1 course comprises sessions dealing with syntax, variables and data types, operators and expressions, conditions and loops, functions, objects, collections, modules and packages, strings, pattern matching, dates, exception handling, files, and databases.

Exercises and examples are used throughout the course to give practical hands-on experience with the techniques covered.

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### Target Audience:

The Python Programming 1 course is aimed at anyone who wants to learn Python as a first language, and developers/engineers who want to migrate to Python from another language, particularly those with little or no object-oriented knowledge.

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### Objectives:

- This course aims to provide the delegate with the knowledge to be able to produce Python scripts and applications that exploit all core elements of the language including variables, expressions, selection and iteration, functions, objects, collections, strings, modules, pattern matching, exception handling, I/O, and classes.
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### Prerequisites:

Delegates attending this course should have some previous programming experience and be able to define general programming concepts including: compilation, execution, variables, arrays, sequence, selection, iteration, functions, objects, and classes. Moreover delegates should be able to navigate the filesystem (on the command line ideally), edit and save text files and browse the web. This knowledge can be obtained by attendance on the pre-requisite Introduction to Programming course.

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### Follow-on-Courses:

- Python Programming 2 (PYP2)
  - Data Analysis Python (PYPDA)
  - Apache Web Server (APH)
  - PHP Programming (PHP)
  - PHP & MySQL for Web Development (PHPMWD)
  - PHP & MariaDB for Web Development (PHPMARWD)
  - Perl Programming (PERL)
  - Ruby Programming (RUBYP)
  - Introduction to MySQL (MYSI)
  - Introduction to MariaDB (MARI)
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## Content:

### Python Programming 1 Training Course Course Contents - DAY 1

#### Course Introduction

- Administration and Course Materials
- Course Structure and Agenda
- Delegate and Trainer Introductions

#### Session 1: GETTING STARTED

- About Python
- Python versions
- Python documentation
- Python runtimes
- Installing Python
- The REPL shell
- Python editors

#### Session 2: PYTHON SCRIPTS ; SYNTAX

- Script naming
- Comments
- Docstring
- Statements
- The backslash
- Code blocks
- Whitespace
- Console IO (to enable the writing of simple programs)
- A first Python program
- Script execution

#### Session 3: VARIABLES ; DATA TYPES

- Literals
- Identifiers
- Assignment
- Numbers (bool,int,float,complex)
- Binary,octal,and hexadecimal numbers
- Collections (str,list,tuple,set,dict)
- None
- Implicit and explicit type conversion (casting)
- The type function

#### Session 4: OPERATORS ; EXPRESSIONS

- Arithmetic Operators
- Assignment Operators
- Comparison Operators
- Logical Operators
- Membership Operators
- Bitwise Operators
- Identity Operators

#### Session 5: CONDITIONS ; LOOPS

- Conditional statements (if,elif,else)
- Short hand if/if else
- Python's alternative to the ternary operator
- Iterative statements (while,for,else)
- The range function

#### Session 6: FUNCTIONS

- Declaration
- Invocation
- Default values for parameters
- Named arguments
- args and kwargs
- Returning multiple values
- Nested functions
- Functions as data
- Introduction to lambda expressions
- Variable scope
- The pass keyword

#### Session 7: OBJECTS AND CLASSES

- About objects
- Attributes and the dot notation
- The dir function
- Dunder attributes
- Mutability
- The id function
- Pass by reference
- Introduction to Classes
- Class Declaration and Instantiation
- Data attributes
- Methods
- Composition

#### Session 8: LISTS

- About lists
- List syntax including slicing
- Getting and setting list elements
- Iterating over a list
- Checking for the presence of a value
- The len function
- List methods incl. append,insert,remove,pop,clear,copy,sort ,reverse etc.
- The del keyword
- Appending to and combining lists
- List comprehension

#### Session 9: TUPLES

- About tuples
- Tuple syntax
- Getting tuple elements including unpacking
- Iterating over a tuple
- Checking for the presence of a value
- The len function
- Appending to and combining tuples

#### Session 10: SETS

- About Sets
- Dictionary syntax
- Creating,adding and removing set elements
- Iterating over a set
- Membership Testing

#### Session 13: MODULES ; PACKAGES

- About modules
- The module search path
- Importing modules
- Namespaces
- Importing module objects
- The import wildcard
- Aliases
- Importing within a function
- Executable modules
- Reloading a module
- About packages
- Importing packaged modules
- Importing packaged module objects
- Package initialisation
- Subpackages
- Referencing objects in sibling packages
- The Standard Library
- Installing modules and packages using pip

#### Session 14: PATTERN MATCHING

- About regular expressions
  - Regular expression special characters
  - Raw strings
  - About the re module
  - re module functions incl. match,search,findall,full match,split,sub
- Python Programming 1 Training Course  
Course Contents - DAY 4

#### Session 15: DATES

- About the datetime module
- datetime object attributes
- Creating a datetime object
- Date arithmetic
- Formatting dates

#### Session 16: EXCEPTION HANDLING

- About exceptions and exception handling
- Handling exceptions (try,except,else,finally)
- Exception types
- The exception object
- Raising exceptions
- Custom exception types

#### Session 17: FILES ; THE FILESYSTEM

- The open function
- Methods for seeking (seekable,seek)
- Methods for reading from a file (readable,read,readline,readlines)
- Iterating over a file
- Methods for writing to a file (writable,write,writelines)
- Introduction to context managers
- File parsing for files of type CSV,XML,JSON,YAML
- About the os module

- Iterating over a list
  - Break
  - Continue
  - Nested conditional/iterative statements
- Python Programming 1 Training Course  
Course Contents - DAY 2

- Sorting
  - Copying
  - Set methods incl.  
union,intersection,difference,symmetric\_d  
ifference etc. Python
- Python Programming 1 Training Course  
Course Contents - DAY 3

#### Session 11: DICTIONARIES

- About dictionaries
- Dictionary syntax
- Getting and setting dictionary elements
- Iterating over a dictionary  
(keys,values,and items)
- Checking for the presence of a key
- The len function
- Dictionary methods incl.  
keys,values,items,get,pop,popitem,clear  
etc.
- The del keyword
- Dictionary comprehension

#### Session 12: STRINGS

- About strings
- String syntax including slicing
- Escape characters
- Triple-quoted strings
- Concatenation
- Placeholders
- The format method
- Other methods e.g.  
endswith,find,join,lower,replace,split,start  
swith,strip,upper etc.
- A string as a list of bytes

- os module functions incl.  
getcwd,listdir,mkdir,chdir,remove,rmdir etc.

#### Session 18: DATABASES

- The DB-API
- DP-API implementations
- Establishing a connection
- Creating a cursor
- Executing a query
- Fetching results
- Transactions
- Inserting,updating,and deleting records

### Further Information:

For More information, or to book your course, please call us on Head Office 01189 123456 / Northern Office 0113 242 5931

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