TECHNICAL
EDUCATION
ACADEMY

School of Computer Science

COURSE PROGRAMME

000579

# COMP006 - Python Scripting for Subsurface

In today's fast-paced technological world, Python stands out as a versatile and powerful programming language, essential for professionals across various fields.




Learn from the Best in the Business!

# Course overview

**Intermediate level**

## Why take this course

In today's fast-paced technological world, Python stands out as a versatile and powerful programming language, essential for professionals across various fields. Recognizing this, our "Python Scripting for Subsurface" is meticulously designed to cater to both beginners and seasoned programmers. This intensive course promises a transformative journey, taking you from the foundational elements of Python to the complexities of advanced programming techniques.

The program kicks off with a deep dive into Python's basics, ensuring a strong foundation. Participants will immerse themselves in understanding variables, data types, and control structures, setting the stage for more advanced topics. As the course progresses, learners will explore arrays, functions, and object-oriented programming, with each module thoughtfully crafted to build upon the previous one. This progressive approach guarantees a seamless transition from fundamental concepts to advanced applications.

What sets our program apart is its emphasis on practical, hands-on learning. Each module is interspersed with interactive exercises, mini-projects, and case studies, simulating real-world scenarios. This approach not only solidifies theoretical knowledge but also enhances problem-solving and critical thinking skills. By the end of the course, participants will have not just learned Python, but will have applied it extensively, preparing them for real-world challenges.

The pinnacle of this learning journey is the capstone project, a comprehensive assignment that allows participants to apply all the skills and knowledge acquired throughout the course. In addition to the structured learning modules, our program offers daily office hours for personalized support and doubt clearance, ensuring that every learner's journey is smooth and uninterrupted. Upon completion, participants will not only receive a certification of mastery but will also have developed a robust portfolio showcasing their newfound Python expertise.

# Course overview — continued

## Who it is for and how it helps

The " Python Scripting for Subsurface " is designed to cater to a diverse range of individuals who are keen on enhancing their Python programming skills. This course is ideal for:

• Beginners in Programming: Individuals with little to no prior experience in programming but who have a strong interest in learning Python from scratch.

• Software Developers and Engineers: Professionals in the software development field looking to expand their skill set with Python, one of the most in-demand programming languages in the industry.

• Data Analysts and Scientists: Those working in data analysis, data science, or related fields who want to leverage Python for data manipulation, analysis, and visualization.

• IT Professionals: System administrators, network engineers, and other IT professionals who can use Python for automating routine tasks, scripting, and cybersecurity applications.

• Career Changers: Those looking to transition into a technical field and seeking a comprehensive program to gain relevant and marketable programming skills.

This course is structured to be accessible yet challenging, ensuring that every participant, regardless of their initial skill level, can benefit significantly from it. The blend of theoretical knowledge and practical application makes it suitable for anyone looking to gain a robust understanding of Python programming.

## What you will learn

- Understand Python Fundamentals: Grasp the basics of Python, including syntax, variables, data types, and control structures, forming a solid foundation for advanced learning
- Write Efficient Python Code: Develop the ability to write clean, efficient, and error-free Python code, applying best practices and coding standards
- Utilize Advanced Python Features: Gain proficiency in advanced Python concepts such as object-oriented programming, lambda functions, and exception handling
- Handle Data with Python: Acquire skills in managing and processing data using Python's powerful libraries like Pandas, NumPy, and Matplotlib for data analysis and visualization
- Develop and Debug Python Applications: Learn to create functional Python applications and use debugging tools to identify and fix code issues
- Implement File Handling and Data Storage: Master techniques to read, write, and manipulate files and understand basic data storage methods in Python
- Work with Python Libraries and Modules: Become adept at utilizing various Python libraries and modules for specialized tasks, including web development, machine learning, and scientific computing
- Apply Python in Real-World Scenarios: Translate theoretical knowledge into practical solutions, solving real-world problems and automating tasks using Python
- Complete a Capstone Project: Demonstrate their newly acquired Python skills by completing a comprehensive capstone project, showcasing their ability to handle a project from conception to

# Course overview — continued

execution

# Curriculum

Modules 01–06

## 01 Introduction to Python

- Overview of Python and Environment Setup
- Variables and Data Types
- Casting and Operators
- Basic User Input

## 02 Control Structures in Python

- Loops (For, While)
- Control Statements (If, Else, Elif)
- Practical Loop and Control Statement Exercises

## 03 Data Collections and Functions

- Arrays, Lists, Tuples, and Dictionaries
- Introduction to Functions
- Modular Programming in Python

## 04 Advanced Functions and Error Handling

- Deep Dive into Functions and Lambda Functions
- Error and Exception Handling (Try...Except Blocks)

## 05 File Handling and Python Modules

- File Operations (Reading, Writing, Appending)
- Exploring Python Modules
- Installing Packages with Pip

## 06 Mathematics and Date Handling

- Python's Math Module and Calculations
- Working with Dates and Time

# Curriculum

Modules 07–09

## 07 Data Analysis and Visualization

- Introduction to Numpy
- Data Manipulation with Pandas
- Advanced Pandas Operations
- Introduction to Matplotlib for Data Visualization
- Exploring JSON and Scipy

## 08 Object-Oriented Programming in Python

- Principles of Object-Oriented Programming
- Classes, Objects, and Inheritance
- Hands-on OOP Projects

## 09 Introduction to Machine Learning with Python

- Overview of Machine Learning Concepts
- Introduction to Python's Machine Learning Libraries
- Implementing a Simple Machine Learning Model

# Participation and contacts

## Joining the programme

Contact the Academy and quote course code 000579 to confirm dates, delivery format, prices and enrolment terms.

## Training for your team

Tell us your business goals, the roles and number of participants, and your preferred dates and location. This will help us discuss the right training option.

## Preparing for the programme

The published programme does not specify any prerequisites. Contact us before enrolling to confirm how to prepare.

## Discuss your training needs

mail@tecedu.org
www.tecedu.academy

Learn from the Best in the Business!