

KOENIG SOLUTIONS • COURSE OUTLINE

Python for Engineering Applications with Machine Learning Foundations

Learn to write Python programs using core syntax, data structures, object-oriented design and file handling, building toward machine learning foundations.

8

MODULES

22

TOPICS

COURSE OVERVIEW

Welcome to the Python Programming course tailored for engineers from diverse fields, designed to equip you with foundational and intermediate skills necessary to become proficient in Python. This course is structured to guide you from understanding basic syntax to mastering essential programming concepts, all while providing practical applications and real-world examples. Whether you have limited or no prior exposure to programming, this curriculum will provide you with the tools and knowledge to succeed in programming and serve as a prerequisite for your next class on Machine Learning Model Development.

WHO THIS COURSE IS FOR

Engineers**Software Developers****Data Analysts****Aspiring Machine Learning Practitioners**

LEARNING OBJECTIVES

- Explain Python syntax, structure and environment setup
- Apply variables, control flow and functions in programs
- Implement lists, tuples, sets and dictionaries
- Design simple classes and apply inheritance principles
- Handle exceptions to write robust Python code
- Perform file operations including CSV and JSON formats
- Develop a basic Python application through group projects
- Describe Python's role in data analysis and machine learning

8 Modules, 22 Topics

01

Introduction to Python

TOPICS

Overview of Python Programming Language · Setting Up the Python Environment · Understanding Python Syntax and Structure

02

Core Python Concepts

TOPICS

Variables and Data Types · Control Flow and Conditional Statements · Functions and Modular Programming

03

Data Structures in Python

TOPICS

Introduction to Lists, Tuples, and Sets · Working with Dictionaries · Basic Data Structure Operations

04

Introduction to Object-Oriented Programming

TOPICS

- Basic Principles of Object-Oriented Programming
- Designing Simple Classes
- Introduction to Inheritance

05

Error Handling and Exceptions

TOPICS

- Understanding Exceptions in Python
- Writing Robust Code with Basic Exception Handling

06

File Handling and I/O

TOPICS

Working with Files in Python · Introduction to File Context Managers · Basic CSV and JSON Operations

07

Practical Applications and Projects

TOPICS

Developing a Basic Python Application · Group Exercises and Collaborative Projects

Preparation for Machine Learning

TOPICS

- Introduction to Python for Data Analysis
- Understanding Python's Role in Machine Learning
- **Preparing for the Next Step:** Machine Learning Model Development

NOTES

- This curriculum is designed to provide a strong foundation in Python programming, preparing you for a variety of challenges and opportunities in engineering and beyond, paving the way for more advanced learning in data science and machine learning.

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Hands-on exercises throughout the course
- Delivery by certified instructors and subject matter experts
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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