# Learning Python – Syllabus

Generated on: 2025-06-16 14:02:41

## Learning Python - 15-Week Syllabus  
  
\*\*Course Objectives:\*\* Understand Python Syntax & Structure; Write Python Programs; Use Data Types & Operators Effectively; Implement Control Structures; Modularize Code with Functions & Modules; Handle Errors & Exceptions; Apply Object-Oriented Programming (OOP); Work with Libraries & Packages; Manipulate Files & Data; Build Real-world Mini Projects.  
  
  
\*\*Week 1: Introduction to Python & Setup\*\*  
\* Main Topic: Introduction to Programming and Python  
\* Subtopics: What is Python?, Setting up your environment (installation, IDE), First Python program ("Hello, world!"), basic output (print function).  
\* Activity: Hands-on exercise: printing different data types.  
  
  
\*\*Week 2: Data Types and Operators\*\*  
\* Main Topic: Data types and Operators in Python  
\* Subtopics: Integers, Floats, Strings, Booleans, Operators (+, -, \*, /, //, %, \*\*), Type conversion.  
\* Activity: Quiz on data types and operators.  
  
  
\*\*Week 3: Strings and String Manipulation\*\*  
\* Main Topic: Working with Strings  
\* Subtopics: String slicing, indexing, concatenation, methods (upper(), lower(), split(), etc.), string formatting.  
\* Activity: Lab: String manipulation exercises (e.g., palindrome checker).  
  
  
\*\*Week 4: Lists and Tuples\*\*  
\* Main Topic: Lists and Tuples  
\* Subtopics: Creating, accessing, modifying lists and tuples, list methods (append(), insert(), remove(), etc.), tuple immutability.  
\* Activity: Lab: List and tuple manipulation exercises.  
  
  
\*\*Week 5: Dictionaries and Sets\*\*  
\* Main Topic: Dictionaries and Sets  
\* Subtopics: Creating, accessing, modifying dictionaries and sets, dictionary methods (keys(), values(), items(), etc.), set operations (union, intersection, difference).  
\* Activity: Case study: analyzing a dataset using dictionaries.  
  
  
\*\*Week 6: Control Flow - Conditional Statements\*\*  
\* Main Topic: Conditional Statements  
\* Subtopics: `if`, `elif`, `else` statements, nested conditionals, logical operators (and, or, not).  
\* Activity: Lab: Building a simple decision-making program (e.g., grade calculator).  
  
  
\*\*Week 7: Control Flow - Loops\*\*  
\* Main Topic: Loops  
\* Subtopics: `for` loops, `while` loops, iterating through lists, dictionaries, and strings, `break` and `continue` statements.  
\* Activity: Lab: Looping exercises (e.g., factorial calculator).  
  
  
\*\*Week 8: Functions\*\*  
\* Main Topic: Functions and Modularity  
\* Subtopics: Defining functions, function parameters and arguments, return values, scope, docstrings.  
\* Activity: Quiz on functions and scope.  
  
  
\*\*Week 9: Modules and Packages\*\*  
\* Main Topic: Using Modules and Packages  
\* Subtopics: Importing modules (math, random, etc.), creating custom modules, installing packages using pip, using external libraries.  
\* Activity: Lab: Using a library like `requests` to fetch data from a website.  
  
  
\*\*Week 10: Exception Handling\*\*  
\* Main Topic: Error Handling and Exceptions  
\* Subtopics: `try`, `except`, `finally` blocks, handling different exception types.  
\* Activity: Lab: Building a program with robust error handling.  
  
  
\*\*Week 11: Object-Oriented Programming (OOP) - I\*\*  
\* Main Topic: Introduction to OOP  
\* Subtopics: Classes and objects, attributes and methods, constructors (`\_\_init\_\_`).  
\* Activity: Lab: Creating a simple class (e.g., a `Dog` class).  
  
  
\*\*Week 12: Object-Oriented Programming (OOP) - II\*\*  
\* Main Topic: Advanced OOP Concepts  
\* Subtopics: Inheritance, polymorphism, encapsulation.  
\* Activity: Lab: Building a program using inheritance (e.g., different types of animals).  
  
  
\*\*Week 13: File I/O and Data Handling\*\*  
\* Main Topic: File Handling and Data Manipulation  
\* Subtopics: Reading and writing files, working with CSV and JSON data.  
\* Activity: Lab: Parsing data from a CSV file.  
  
  
\*\*Week 14: Mini Project - Part 1\*\*  
\* Main Topic: Mini Project Development  
\* Subtopics: Planning and designing a mini project (e.g., calculator, quiz app, simple data parser).  
\* Activity: Project planning and initial coding.  
  
  
\*\*Week 15: Mini Project - Part 2 & Review\*\*  
\* Main Topic: Mini Project Completion and Course Review  
\* Subtopics: Finishing the mini project, code review and debugging, course summary and Q&A.  
\* Activity: Mini project presentation and final quiz.

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