# Learning Python – Syllabus

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\*\*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 & Setting up your environment\*\*  
\* Main Topic: Introduction to Python, Setting up Development Environment (IDE/Text Editor)  
\* Subtopics: What is Python?, Why Python?, Installing Python, Choosing an IDE (VS Code, PyCharm, Thonny), Hello World program.  
\* Activity: Setup Quiz & First Python Program  
  
  
\*\*Week 2: Basic Syntax and Data Types\*\*  
\* Main Topic: Variables, Data Types, Operators  
\* Subtopics: Variables and assignment, Integers, Floats, Strings, Booleans, Basic Arithmetic Operators, Type Conversion.  
\* Activity: Data Type Exercises & Simple Calculator Lab  
  
  
\*\*Week 3: String Manipulation and Operators\*\*  
\* Main Topic: Working with Strings  
\* Subtopics: String slicing, String methods (upper(), lower(), split(), join()), String formatting, Comparison operators.  
\* Activity: String Manipulation Quiz & Case Study: Analyzing Text Data  
  
  
\*\*Week 4: Control Flow: Conditional Statements\*\*  
\* Main Topic: Conditional Statements  
\* Subtopics: if, elif, else statements, Nested conditional statements, Boolean logic (and, or, not).  
\* Activity: Conditional Logic Exercises & "Number Guessing Game" Lab  
  
  
\*\*Week 5: Control Flow: Loops\*\*  
\* Main Topic: Loops and Iterations  
\* Subtopics: for loops, while loops, break and continue statements, Looping through sequences (strings, lists).  
\* Activity: Looping Exercises & "Fibonacci Sequence Generator" Lab  
  
  
\*\*Week 6: Lists, Tuples, and Sets\*\*  
\* Main Topic: Working with Collections  
\* Subtopics: Lists (creation, manipulation, methods), Tuples (immutability), Sets (unique elements, set operations).  
\* Activity: Collection Manipulation Exercises & "Student Grade Manager" Lab (using lists)  
  
  
\*\*Week 7: Dictionaries\*\*  
\* Main Topic: Dictionaries and Data Structures  
\* Subtopics: Dictionary creation, accessing values, methods (keys(), values(), items()), iterating through dictionaries.  
\* Activity: Dictionary Exercises & "Contact Book" Lab  
  
  
\*\*Week 8: Functions\*\*  
\* Main Topic: Functions and Modular Programming  
\* Subtopics: Defining functions, parameters and arguments, return values, scope, docstrings.  
\* Activity: Function Exercises & "Simple Math Library" Lab  
  
  
\*\*Week 9: Modules and Packages\*\*  
\* Main Topic: Using Modules and Packages  
\* Subtopics: Importing modules, using built-in modules (math, random, os), installing packages with pip, using external packages.  
\* Activity: Module Usage Exercises & "Dice Rolling Simulator" Lab (using random module)  
  
  
\*\*Week 10: Exception Handling\*\*  
\* Main Topic: Error Handling and Exceptions  
\* Subtopics: try, except, else, finally blocks, common exceptions (TypeError, ValueError, FileNotFoundError).  
\* Activity: Exception Handling Exercises & "Robust File Reader" Lab  
  
  
\*\*Week 11: Introduction to Object-Oriented Programming (OOP)\*\*  
\* Main Topic: Classes and Objects  
\* Subtopics: Defining classes, creating objects, attributes, methods, constructors (`\_\_init\_\_`).  
\* Activity: OOP Basics Exercises & "Simple Animal Class" Lab  
  
  
\*\*Week 12: OOP: Inheritance and Encapsulation\*\*  
\* Main Topic: OOP Principles  
\* Subtopics: Inheritance (creating subclasses), encapsulation (data hiding), polymorphism.  
\* Activity: OOP Principles Exercises & "Shape Inheritance" Lab  
  
  
\*\*Week 13: File I/O and Data Serialization\*\*  
\* Main Topic: File Handling and Data Manipulation  
\* Subtopics: Reading and writing files, working with CSV files, working with JSON files.  
\* Activity: File I/O Exercises & "Data Parser" Lab (CSV or JSON)  
  
  
\*\*Week 14: Mini-Project 1: Calculator or Quiz App\*\*  
\* Main Topic: Project Development  
\* Subtopics: Design, implementation, testing.  
\* Activity: Mini-Project 1: Develop a calculator or quiz application  
  
  
\*\*Week 15: Mini-Project 2: Data Parser or Other Application\*\*  
\* Main Topic: Project Development & Review  
\* Subtopics: Design, implementation, testing, presentation.  
\* Activity: Mini-Project 2: Develop a data parser or another application of your choice; Final Project Presentations.

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