# Learning Python – Curated Content – Syllabus

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## Learning Python – Curated Content: 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: Setting up Python environment, IDE introduction.  
\* Subtopics: Installing Python, Choosing an IDE (VS Code, PyCharm), First Python program ("Hello, World!").  
\* Activity: Setup quiz & writing a simple "Hello, [Your Name]" program.  
  
  
\*\*Week 2: Basic Syntax and Data Types\*\*  
\* Main Topic: Variables, Data types (integers, floats, strings, booleans).  
\* Subtopics: Variable assignment, Type conversion, Basic arithmetic operations, String manipulation (slicing, concatenation).  
\* Activity: Lab – exercises on data type manipulation and string operations.  
  
  
\*\*Week 3: Operators and Expressions\*\*  
\* Main Topic: Arithmetic, comparison, logical, and bitwise operators.  
\* Subtopics: Operator precedence, Boolean logic, Conditional expressions.  
\* Activity: Quiz – testing understanding of operators and expressions.  
  
  
\*\*Week 4: Control Flow (Conditional Statements)\*\*  
\* Main Topic: if, elif, else statements.  
\* Subtopics: Nested conditional statements, Boolean expressions in conditionals.  
\* Activity: Lab – building a simple calculator application with conditional logic.  
  
  
\*\*Week 5: Control Flow (Loops)\*\*  
\* Main Topic: for and while loops.  
\* Subtopics: Loop control statements (break, continue), Iterating through sequences.  
\* Activity: Lab – creating a program to generate Fibonacci sequence using loops.  
  
  
\*\*Week 6: Data Structures – Lists and Tuples\*\*  
\* Main Topic: Lists and tuples, their properties and methods.  
\* Subtopics: List comprehension, Tuple packing and unpacking.  
\* Activity: Case study – analyzing a list of student grades.  
  
  
\*\*Week 7: Data Structures – Dictionaries and Sets\*\*  
\* Main Topic: Dictionaries and sets, their properties and methods.  
\* Subtopics: Dictionary comprehension, Set operations (union, intersection).  
\* Activity: Lab – building a simple phonebook application using dictionaries.  
  
  
\*\*Week 8: Functions\*\*  
\* Main Topic: Defining and using functions.  
\* Subtopics: Function arguments and return values, Scope and lifetime of variables.  
\* Activity: Lab – creating functions for various mathematical operations.  
  
  
\*\*Week 9: Modules and Packages\*\*  
\* Main Topic: Importing and using modules, creating custom modules.  
\* Subtopics: `math`, `random`, `datetime` modules. Using `pip` to install packages.  
\* Activity: Lab – using external libraries for data manipulation (e.g., NumPy introduction).  
  
  
\*\*Week 10: Exception Handling\*\*  
\* Main Topic: `try`, `except`, `finally` blocks.  
\* Subtopics: Common exceptions, raising exceptions.  
\* Activity: Lab – writing a program that handles potential file errors.  
  
  
\*\*Week 11: Object-Oriented Programming (OOP) – Introduction\*\*  
\* Main Topic: Classes and objects, attributes and methods.  
\* Subtopics: `\_\_init\_\_` method, creating simple classes.  
\* Activity: Lab – creating a `Dog` class with attributes and methods.  
  
  
\*\*Week 12: OOP – Inheritance and Polymorphism\*\*  
\* Main Topic: Inheritance, method overriding, polymorphism.  
\* Subtopics: Class inheritance, abstract classes (brief introduction).  
\* Activity: Lab – extending the `Dog` class to create subclasses (e.g., `Labrador`).  
  
  
\*\*Week 13: File Handling\*\*  
\* Main Topic: Reading and writing files.  
\* Subtopics: Working with text files, CSV files, JSON files.  
\* Activity: Lab – reading data from a CSV file and writing results to a new file.  
  
  
\*\*Week 14: Mini-Project 1\*\*  
\* Main Topic: Building a small Python application.  
\* Subtopics: Choosing a project (calculator, simple quiz app, data parser).  
\* Activity: Mini-project – students work on their chosen project.  
  
  
\*\*Week 15: Mini-Project 2 & Review\*\*  
\* Main Topic: Project presentations and course review.  
\* Subtopics: Project presentations, Q&A, course summary.  
\* Activity: Mini-project presentations and final quiz (covering all topics).

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