Python Programming

1. **Introduction to Python**
    - What is Python?
    - Installing Python and setting up the environment
    - Python IDEs: Jupyter Notebook, PyCharm, etc.
    - Python syntax and structure
    - Writing and running your first Python program

Basic Python Programming Constructs

2. **Variables and Data Types**
    - Variables, constants, and naming conventions
    - Data types: Numbers, Strings, Lists, Tuples, Dictionaries, Sets
    - Type conversion
    - Input/output in Python
3. **Operators**
    - Arithmetic, comparison, logical, bitwise operators
    - Assignment operators
    - Operator precedence
4. **Control Flow**
    - If-else conditions
    - Nested conditions
    - Loops: for, while
    - Break, continue, and pass statements

Python Data Structures

5. **Lists and Tuples**
    - List operations and methods
    - List slicing
    - Tuples and immutability
    - Tuple operations
6. **Dictionaries and Sets**
    - Dictionary operations and methods
    - Sets and set operations

Functions and Modules

7. **Functions**
    - Defining functions
    - Function arguments and return values
    - Recursion
    - Lambda functions
    - Built-in functions
8. **Modules and Packages**
    - Importing modules
    - Standard library overview
    - Installing and using external packages (pip)
    - Creating your own modules and packages

Object-Oriented Programming in Python

9. **Classes and Objects**
    - Defining classes and objects
    - Constructors and destructors
    - Class attributes and methods
    - Instance attributes and methods
10. **Inheritance and Polymorphism**
    - Inheritance in Python
    - Method overriding
    - Polymorphism and encapsulation

File Handling

11. **File I/O**
    - Reading from and writing to files
    - Handling file exceptions
    - Working with different file types (text, CSV, etc.)

Error and Exception Handling

12. **Errors and Exceptions**
    - Types of exceptions
    - Try, except, finally blocks
    - Raising exceptions
    - Custom exceptions

Advanced Python Topics

13. **Comprehensions**
    - List comprehensions
    - Dictionary comprehensions
    - Set comprehensions
14. **Decorators and Generators**
    - Understanding decorators
    - Creating and using decorators
    - Understanding and using generators
15. **Iterators**
    - Working with iterators
    - Custom iterator classes

Python Libraries and Frameworks

16. **Introduction to Libraries**
    - Numpy (for numerical computing)
    - Pandas (for data manipulation)
    - Matplotlib/Seaborn (for data visualization)
    - Scikit-learn (for machine learning basics)
    - Flask/Django (for web development basics)

Working with Databases

17. **Databases with Python**
    - Introduction to SQL
    - Connecting Python with databases (SQLite, MySQL)
    - CRUD operations with databases