

# Python Advanced (OPP)

## Session 1: Introduction to Python and OOP Concepts

In this introductory session, participants will explore the fundamentals of Python programming and Object-Oriented Programming (OOP) concepts. The session will cover:

- Definition and significance of Object-Oriented Programming in Python.
- Comparison between Procedural Programming and Object-Oriented Programming.
- Basic OOP concepts such as classes, objects, inheritance, and polymorphism will be explained using straightforward examples.
- Participants will create a simple class, instance objects, and demonstrate basic interactions between objects.

## Session 2: Building Blocks of OOP: Classes and Objects

Building upon the previous session, participants will delve deeper into OOP concepts focusing on:

- Detailed exploration of classes including their structure, attributes, methods, and constructors.
- Classes vs Data Structures
- Practical exercises like animals, vehicle, or people.

## Session 3: Encapsulation and Inheritance

This session will cover advanced OOP concepts:

- Class and instance attributes.
- Class methods and instance methods.
- Explanation of encapsulation and its role in hiding implementation details.
- Introduction to inheritance and how classes can inherit attributes and methods from other classes.
- Discussion on multiple inheritance.
- Demonstration of encapsulation using static methods, getters, and setter methods in Python.

## **Session 4: Abstraction and Polymorphism**

**Participants will delve into inheritance and polymorphism:**

- **Understanding abstraction and its significance in focusing on essential features while concealing unnecessary details.**
- **Definition of polymorphism and its role in treating different objects interchangeably.**
- **Hands-on activity implementing inheritance and polymorphism in a project where different types of vehicles share common functionalities.**
- **Overview of method overloading.**
- **Practical exercises abstraction , Create classes with private attributes and methods.**

## **Session 5: Advanced OOP Concepts**

**Participants will explore more advanced OOP concepts:**

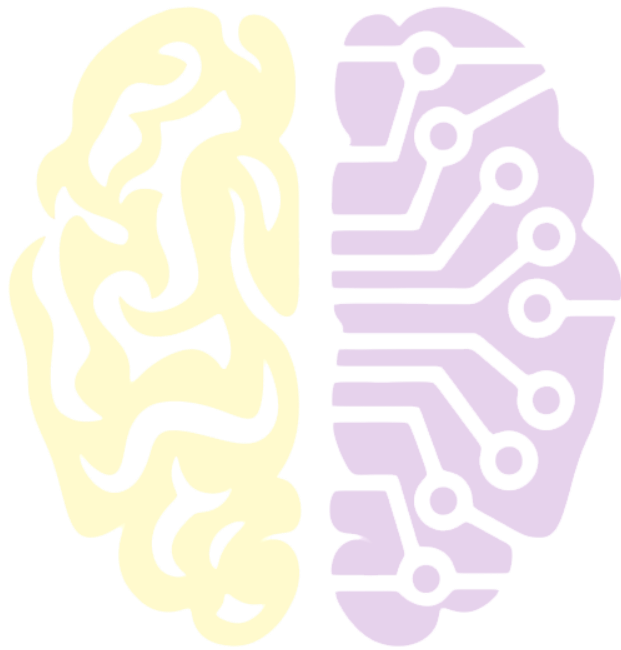
- **Comparison between composition and inheritance, discussing their appropriate usage scenarios.**
- **Explanation of method overriding and its implementation in subclasses.**
- **Hands-on activity where students design a project and decide between composition and inheritance.**

## **Session 6: Project Showcase and Review**

**The final session will include:**

- **Project presentations where participants showcase their projects developed throughout the course.**
- **Recap of key concepts covered in the course.**
- **Question and answer session to address any remaining queries or concerns.**

**By the end of the course, participants will have a solid understanding of advanced OOP concepts in Python, enabling them to design and implement complex software systems efficiently and effectively.**



# DISCOVERY

 ACADEMY FOR SCIENCE AND TECHNOLOGY