

Developing Object-Oriented Programming

Course/Duty Area: Programming, Advanced/Developing Object-Oriented Programming

Scenario:

1. Introduction to Object-Oriented Programming (OOP)

Objective: Students will understand the fundamental concepts of OOP, including classes and objects.

Key Points:

- Definition of OOP
- Benefits of OOP
- Overview of classes and objects

Assessment: Class discussion and quick quiz on key terms (e.g., class, object, instance).

2. Principles of OOP

Objective: Students will explore the four main principles of OOP: encapsulation, inheritance, polymorphism, and abstraction.

Key Points:

- Explanation of each principle
- Examples in real-world scenarios
- Discussion on how these principles enhance programming

Assessment: Group/individual activity where students create a visual representation of the four principles.

3. Steps in OOP Development

Objective: Students will learn the steps involved in developing an OOP program, including planning, designing, coding, and testing.

Key Points:

- Breakdown of the development process
- Importance of each step in successful programming
- Discussion on common pitfalls

Assessment: Create a flowchart that outlines the steps of OOP development

4. **Creating User-Defined Classes**

Objective: Students will create their own user-defined classes in a programming language of choice (e.g., Python, Java).

Key Points:

- Syntax for defining classes
- Attributes and methods
- Creating objects from classes

Assessment: Submit a simple program that includes at least one user-defined class with attributes and methods.

5. **Project Day - Building an OOP Application**

Objective: Students will apply their knowledge of OOP to develop a small application that utilizes user-defined classes.

Key Points:

- Review of class definitions and principles
- Work on projects
- Peer feedback

Assessment: Presentation of the final project showcasing the application and explaining the classes created.

Big Question: Do you understand OOP, and can you write a user-defined program in the language of your choice?

Focused Questions:

- Did you design and create methods and properties for each class?
- Does the program use the class parameter of the create function statement?
- Does the program run successfully?

Student Project or Outcome: Students will create a user-defined class program. Students will understand the components that go into creating this type of program.

Project-Based Assessment: Presentation of the final project showcasing the application and explaining the classes created.

Scenario submitted by Elisa Bradford, Blue Ridge Technical Center, Warren County Public Schools