

# Advanced Programming (6641)

## Developing Object-Oriented Programming (OOP) AP.1

- 1 Explain the reasoning behind the steps in the software development life cycle (SDLC).** AP.1.1

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- 2 Describe the primary principles of object-oriented programming (OOP).** AP.1.2

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- 3 Identify potential objects, attributes, and methods within a problem description.** AP.1.3

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- 4 Design attributes (properties) and methods of each class within a problem description.** AP.1.4

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- 5 Create a program with user-defined classes.** AP.1.5

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- 6 Describe the concept of reusability.** AP.1.6

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- 7 Identify reusable resources that will help solve a problem.** AP.1.7

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- 8 Import code from existing sources.** AP.1.8

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- 9 Describe the concepts of overloading and overriding methods in an object-oriented language.** AP.1.9

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- 10 Code a program that uses looping structures, conditional structures, and sequential control structures.** AP.1.10

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- 11 Analyze abstract data types.** AP.1.11

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- 12 Implement searching and sorting algorithms.** AP.1.12

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- 13 Code a program that uses error-handling and input-validation procedures.** AP.1.13

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- 14 Code a program to use an interface.** AP.1.14

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- 15 Create a test suite that will verify proper operation of a class or group of related classes.** AP.1.15

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- 16 Perform a peer review and test of a program.** AP.1.16

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**17 Analyze code that uses recursion.** AP.1.17

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**Developing Database Applications** AP.2

**1 Identify relational database terminology.** AP.2.1

**2 Identify database model types.** AP.2.2

**3 (Optional) Describe the three-layer/tier model for database applications.** AP.2.3

**4 Identify the data object model for the program language.** AP.2.4

**5 Design a GUI for a database application.** AP.2.5

**6 Write code to integrate an existing database into a program application.** AP.2.6

**7 Write code to manage a database.** AP.2.7

**8 Bind database fields to the interface elements (controls).** AP.2.8

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**Developing Interactive Multimedia Applications** AP.3

**1 Write a design document for a game.** AP.3.1

**2 Code a multiplayer game.** AP.3.2

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**Developing Connected Applications (Mobile and/or Web)** AP.4

**1 Determine the programming languages used to create connected applications.** AP.4.1

**2 Design a web application with security features.** AP.4.2

**3 (Optional) Design a GUI for a connected application.** AP.4.3

**4 (Optional) Code a web application (e.g., shopping cart) for a smart device or emulator.** AP.4.4

**5 (Optional) Describe the process of mobile application deployment.** AP.4.5

**6 (Optional) Describe the web application publishing process.** AP.4.6

**7 Describe client-side and server-side applications.** AP.4.7

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**Preparing for Industry Certification** AP.5

**1 Describe the process and requirements for obtaining industry certifications related to the Programming, Advanced course.** AP.5.1

**2 Identify testing skills/strategies for a certification examination.** AP.5.2

**3 Demonstrate ability to successfully complete selected practice examinations (e.g., practice questions similar to those on certification exams).** AP.5.3

**4 (Optional) Successfully complete an industry certification examination representative of skills learned in this course (e.g., MCP, IC3).** AP.5.4

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**Developing  
Employability  
Skills** AP.6

- 1 Investigate continuing education pathways and careers in the information technology industry.** AP.6.1

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- 2 Create or update a résumé.** AP.6.2

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- 3 Update professional portfolio.** AP.6.3

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- 4 Deliver an oral presentation of programming projects.** AP.6.4