University of Phoenix®

SYLLABUS

PRG/421 Java® Programming II

Course Description

This course is an advanced study in Java Programming. It covers topic around advanced Java class design, object oriented design principles, design patterns, threads, concurrency, localization and building database applications. These topics are closely aligned with Oracle Certified Professional Java SE examination.

Course Dates

35 days

Academic Standards

The following standards apply to or are associated with this course for accreditation, governance, or compliance.

State

State specific standards will be displayed here when class starts

Faculty Information

See Policies

Policies

Faculty and students/learners will be held responsible for understanding and adhering to all policies contained within the following two documents (both located on your student website):

- Academic Policies

University policies are subject to change. Be sure to read the policies at the beginning of each class. Policies may be slightly different depending on the modality in which you attend class. If you have recently changed modalities, read the policies governing your current class modality.

Academic Resources

- Course Software

  Instructions
  Check the Course Software link to see if this course requires additional software. We do not recommend trial software versions because they expire.

  SupportingMaterial
  Course Software
- SkillSoft®

  Instructions
  Access the SkillSoft® link.

  SupportingMaterial
  SkillSoft®
- The College of IS&T Website

  Instructions
  Access the College of IS&T Website link.

  SupportingMaterial
  The College of IS&T Website
- Programming Code Citations

  Instructions
  Access a tutorial on how to give proper citations for programming code.

  SupportingMaterial
  Programming Code Citations

Faculty Setup Tasks

- Additional Supporting Activities

  Instructions
  Review additional supporting activities.

  SupportingMaterial
  Additional Supporting Activities

Student Pre-class Tasks

- Familiarize yourself with the textbooks used in this course.

  Instructions
  Sierra, K. & Bates, B. (2015). OCA/OCP Java SE 7 programmer I & II study guide (exams 1Z0-803 & 1Z0-804. New York: McGraw-Hill Education.

- OCP Exam Download

  Instructions
  Download the OCP Exam using the link to access exams throughout this course.
  Enter the following access code: 0071771999
  NOTE: The exam we be used in each week of the course.

  SupportingMaterial
  OCP Exam Download

Course Materials

All electronic materials are available on your student website.

Week1

Object-Oriented Design Principles, Advanced Class Design

Tasks

Student

- Learning Team Instructions: Program Improvement
- Learning Team Charter
- Read Me First

Objectives/Competencies

1.1 Analyze Java class design.

1.2 Identify advanced Java class design.

1.3 Apply the object-oriented design principles using Java language.

Required Learning Activities

- Ch. 1, OCA/OCP Java SE 7 Programmer I & II Study Guide

  Instructions
  Read Ch. 1, "Declare and Use Enums," of OCA/OCP Java SE 7 programmer I & II study guide.

- Ch. 10, OCA/OCP Java SE 7 Programmer I & II Study Guide

  Instructions
  Read Ch. 10, "Advanced OO and Design Patterns," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

- Ch. 12, OCA/OCP Java SE 7 Programmer I & II Study Guide

  Instructions
  Read Ch. 12, "Inner Classes," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

- Week One Electronic Reserve Readings

  Instructions
  Read this week's Electronic Reserve Readings.

  Support Material
  Electronic Reserve Readings

See the student website for additional recommended learning activities that may help you learn this week's concepts.

Assignments

Title	Type	Due	Points
Participation Instructions: **Participate** in class discussion.	Individual	Due day 7	4
Individual Test Practice: OCP Practice Test Instructions: **Select** and complete the following exam objectives in OCP Exam: · Java Class Design · Advanced Class Design · Object-Oriented Design Principles **Submit** a .PDF of your results to the Assignment Files tab above. SupportingMaterial:OCP Exam Download	Individual	Due day 7	2
Individual: Singleton Pattern Program Instructions: **Write** a Java program (non-GUI preferred) to demonstrate the Singleton pattern. The key parts of the singleton pattern are: · A private static variable to store the single instance called the singleton · A public static method for callers to get a reference to the instance · A private constructor so no callers can instantiate the object directly **Using** these key parts, write a Java program that will allow a user of the program to assign only one runner to each of the 8 lanes of running track in a field. **Include** a brief documentation (in the code or in a separate document) to explain the input (if any), processing and output of the program. **Submit** your assignment using the Assignment Files tab above.	Individual	Due day 7	10

Week2

Assertions, Exceptions, Data Formatting and Localization

Objectives/Competencies

2.1 Analyze custom exceptions.

2.2 Identify the use of assertion.

2.3 Apply advanced string and data formatting.

2.4 Describe the use of localization in Java programs.

Required Learning Activities

• Ch. 7, OCA/OCP Java SE 7 Programmer I & II Study Guide

Instructions
Read Ch. 7, "Assertions and Java 7 Exceptions," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

• Ch. 8, OCA/OCP Java SE 7 Programmer I & II Study Guide

Instructions
Read Ch. 8, "String Processing, Data Formatting, Resource Bundles," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

• Week Two Electronic Reserve Readings

Instructions

Read this week's Electronic Reserve Readings.

Support Material

Electronic Reserve Readings

See the student website for additional recommended learning activities that may help you learn this week's concepts.

Assignments

Title	Type	Due	Points
Participation Instructions: **Participate** in class discussion.	Individual	Due day 7	4
Individual Test Practice: OCP Practice Test Instructions: **Select** and complete the following exam objectives in OCP Exam: · Exceptions and Assertions · String Processing · Localization **Submit** a .PDF of your results to the Assignment Files tab above. SupportingMaterial:OCP Exam Download	Individual	Due day 7	2
Individual: ArrayList Program Instructions: **Write** a Java program (non-GUI preferred) to demonstrate the use of an ArrayList. The program should allow a user to do the following: · Add, edit, delete different types of animals · Select an animal, and the corresponding characteristics will be displayed (such as color, vertebrate or invertebrate, can swim, etc.) · The program must use ArrayList(s) to work with these animal objects. **Include** a brief documentation (in the code or in a separate document) to explain the input (if any), processing and output of the program. **Submit** your assignment using the Assignment Files tab above.	Individual	Due day 7	10
Learning Team: Program Improvement I Instructions: **Select** one program submitted by a team member in Week One. **Suggest** at least 3 ways to improve the selected program. One of these improvements must be related to applying assertion, exceptions, data formatting or localization. **Write** code and test the improved program. Deliverables should include: · The source code file(s) of the improved program. · A 2- to 3-page paper on the approach the team has taken to improve the program. · Why some of the changes are relevant to this week's objectives. · Any challenges the team encountered and suggest any future improvements. **Submit** your assignment using the Assignment Files tab above. SupportingMaterial:Learning Team Instructions: Fundraiser ProgramLearning Team: Initial programLearning Team: Add a Data FileLearning Team: Connect to a Database	Learning team	Due day 7	5

Week3
Generics, Collections and Input/Output

Objectives/Competencies

3.1 Analyze the use of generic class.

3.2 Apply the use of a List, a Set, a Deque and a Map.

3.3 Apply Java File Input/Output (I/O).

Required Learning Activities

• Ch. 9, OCA/OCP Java SE 7 Programmer I & II Study Guide

Instructions
Read Ch. 9, "I/O and NIO," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

• Ch. 11, OCA/OCP Java SE 7 Programmer I & II Study Guide

Instructions
Read Ch. 11, "Generics and Collections," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

• Week Three Electronic Reserve Readings

Instructions
Read this week's Electronic Reserve Readings.

Support Material
Electronic Reserve Readings

See the student website for additional recommended learning activities that may help you learn this week's concepts.

Assignments

Title	Type	Due	Points
Participation Instructions: **Participate** in class discussion.	Individual	Due day 7	4
Individual Test Practice: OCP Practice Test Instructions: **Select** and complete the following exam objectives in OCP Exam: · Generics and Collections · Java I/O fundamentals · Java File I/O (NIO 2) **Submit** a .PDF of your results to the Assignment Files tab above. SupportingMaterial:OCP Exam Download	Individual	Due day 7	2
Individual: Iterator Program Instructions: **Write** a Java program (non-GUI preferred) to demonstrate the use of Iterator. The program should allow a user to do the following: · Allow the reading of a collection of animal objects from an external file. · Output on screen the content of a collection of animal objects. · Use Iterator to achieve these goals. **Include** a brief documentation (in the code or in a separate document) to explain the input (if any), processing and output of the program. **Submit** your assignment using the Assignment Files tab above.	Individual	Due day 7	10

Learning Team: Program Improvement II Instructions: **Select** one program submitted by a team member in Week Two. **Suggest** at least 3 ways to improve the selected program. One of these improvements must be related to the use of generic class, a collection or Java File I/O. **Write** code and test the improved program. Deliverables should include: · The source code file(s) of the improved program. · A 2- to 3-page paper on the approach the team has taken to improve the program. · Why some of the changes are relevant to this week's objectives. · Any challenges the team encountered and suggest any future improvements. **Submit** your assignment using the Assignment Files tab above. SupportingMaterial:Learning Team: Project PlanLearning Team Instructions: Fundraiser ProgramLearning Team: Add a Data FileLearning Team: Connect to a Database	Learning team	Due day 7	5

Week4
Databases and JDBC

Objectives/Competencies

4.1 Describe the interfaces and components of Java Database Connectivity.

4.2 Analyze Java Database Connectivity transactions.

4.3 Apply Java Database Connectivity to connect to a database.

Required Learning Activities

• Ch. 15, OCA/OCP Java SE 7 Programmer I & II Study Guide

Instructions
Read Ch. 15, "JDBC," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

• Week Four Electronic Reserve Readings

Instructions
Read this week's Electronic Reserve Readings.

Support Material
Electronic Reserve Readings

See the student website for additional recommended learning activities that may help you learn this week's concepts.

Assignments

Title	Type	Due	Points
Participation Instructions: **Participate** in class discussion.	Individual	Due day 7	4
Individual Test Practice: OCP Practice Test Instructions: **Select** and complete the following exam objectives in OCP Exam: · Building Database Applications with JDBC **Submit** a .PDF of your results to the Assignment Files tab above. SupportingMaterial:OCP Exam Download	Individual	Due day 7	2

Individual: JDBC Program Instructions: **Write** a Java program (non-GUI preferred) to demonstrate the use of JDBC. The program should allow a user to do the following: · Write a list of animal and its characteristics to a database using JDBC · Display the characteristics of an animal when that animal is selected. **Include** a brief documentation (in the code or in a separate document) to explain the input (if any), processing and output of the program. **Submit** your assignment using the Assignment Files tab above.	Individual	Due day 7	10
Learning Team: Program Improvement III Instructions: **Select** one program submitted by a team member in Week Three. **Suggest** at least 3 ways to improve the selected program. One of these improvements should be related to the use of JDBC. **Write** code and test the improved program. Deliverables should include: · The source code file(s) of the improved program. · A 2- to 3-page paper on the approach the team has taken to improve the program. · Why some of the changes are relevant to this week's objectives. · Any challenges the team encountered and suggest any future improvements. **Submit** your assignment using the Assignment Files tab above. SupportingMaterial:Learning Team: Initial programLearning Team: Project PlanLearning Team Instructions: Fundraiser ProgramLearning Team: Connect to a Database	Learning team	Due day 7	5

Week5

Threads and Concurrency

Objectives/Competencies

5.1 Describe the creation and use of the Thread class.

5.2 Analyze thread synchronization of shared data.

5.3 Apply the Java language support for common concurrent programming use cases.

Required Learning Activities

• Ch. 13, OCA/OCP Java SE 7 Programmer I & II Study Guide

Instructions
Read Ch. 13, "Threads," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

• Ch. 14, OCA/OCP Java SE 7 Programmer I & II Study Guide

Instructions
Read Ch. 14, "Concurrency," of OCA/OCP Java SE 7 Programmer I & II Study Guide.

• Week Five Electronic Reserve Readings

Instructions
Read this week's Electronic Reserve Readings.

Support Material
Electronic Reserve Readings

See the student website for additional recommended learning activities that may help you learn this week's concepts.

Assignments

Title	Type	Due	Points
Participation Instructions: **Participate** in class discussion.	Individual	Due day 7	4
Individual Test Practice: OCP Practice Test Instructions: **Select** and complete the following exam objectives in OCP Exam: · Threads · Concurrency **Submit** a .PDF of your results to the Assignment Files tab above. SupportingMaterial:OCP Exam Download	Individual	Due day 7	2
Individual: Concurrent Programming Instructions: **Write** a Java program (non-GUI preferred) that has a method named atomic(). **Demonstrate** in the program how two threads can, sometimes, invoke atomic() concurrently. **Create** a second version of the program in which the two threads cannot invoke atomic concurrently. **Submit** both programs using the Assignment Files tab above.	Individual	Due day 7	10
Learning Team: Program Improvement IV Instructions: **Select** one program submitted by a team member in Week Three. **Suggest** at least 3 ways to improve the selected program. One of these improvements should be related to the use of thread. **Write** code and test the improved program. Deliverables should include: · The source code file(s) of the improved program. · A 2- to 3-page paper on the approach the team has taken to improve the program. · Why some of the changes are relevant to this week's objectives. · Any challenges the team encountered and suggest any future improvements. **Submit** your assignment using the Assignment Files tab above. SupportingMaterial:Learning Team: Add a Data FileLearning Team: Initial programLearning Team: Project PlanLearning Team Instructions: Fundraiser Program	Learning team	Due day 7	5

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