CONESTOGA

COURSE OUTLINE

Course Programming: Java Enterprise Applications (2016-2017)

Code / Version PROG3060 (100)

Total Hours 45

Credits 3

PreRequisite(s) PROG2240 (100) Programming: JAVA Web Technologies
or PROG2240 (101) Programming: JAVA Web Technologies
or PROG2240 (102) Programming: JAVA Web Technologies
or PROG2240 (103) Programming: JAVA Web Technologies

CoRequisite(s)

Course Description

Building on Programming: Java Web Technologies, the student will use Java and Java compatible tools to develop distributed applications incorporating techniques to support security and transaction management using a tiered architecture. Best practices in deployment, testing and debugging will be emphasized.

PLAR Eligible: No

Course Outcomes

Successful completion of this course will enable the student to:

1. Create tiered, web-based Java EE applications that combine servlets, Enterprise Java Bean (EJB) session bean components, and Hibernate components to provide database access.
2. Write web-based Java EE applications that utilize sessions to permit transactional conversations.
3. Describe the principles that underlie object-relational mapping toolkits such as Hibernate.
4. Develop Java EE applications using both native Hibernate APIs and the standardized Java Persistence API (JPA) for database access.
5. Describe the Java Enterprise Edition (Java EE) multi-tier deployment architecture and the functionality provided by application servers, such as GlassFish, and web servers such as Tomcat.
6. Contrast the development, deployment and performance of native Java applications that utilize JDBC and Java applications that utilize an object-relational mapping tool such as Hibernate.
7. Use a Java EE Integrated Development Environment (IDE) such as Oracle's Enterprise Pack for Eclipse (OEPE).

Essential Employability Skills addressed in this course			Taught	Reinforced	Assessed
Communication	n	Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience			
	n	Respond to written, spoken, or visual messages in a manner that ensures effective communication			
Numeracy	n	Execute mathematical operations accurately			
Critical Thinking and Problem Solving	n	Apply a systematic approach to solve problems		X	X
	n	Use a variety of thinking skills to anticipate and solve problems		X	X
Information Management	n	Locate, select, organize, and document information using appropriate technology and information systems			X
	n	Analyze, evaluate, and apply relevant information from a variety of sources		X	
Interpersonal	n	Show respect for the diverse opinions, values, belief systems, and contributions of others			

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Essential Employability Skills addressed in this course			Taught	Reinforced	Assessed
Interpersonal	n	Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals		X	
Personal	n	Manage the use of time and other resources to complete projects		X	
	n	Take responsibility for one's own actions, decisions, and consequences		X	

Unit Outcomes

Successful completion of the following units will enable the student to:

1.0 Introduction to Java Enterprise Edition (Java EE)

- 1.1 Describe the Java EE architecture and component types
- 1.2 List the Java EE standard enterprise services and APIs
- 1.3 Describe Java EE packaging and differentiate between different archive types (JARs, WARs, EARs) and their development and runtime environments.

2.0 The Eclipse Development Platform and Tools

- 2.1 Use the Eclipse IDE with the Oracle Enterprise Pack for Eclipse (OEPE)
- 2.2 Create, test and debug a simple Java web application
- 2.3 Manipulate a Derby database via both the Derby client and via Eclipse
- 2.4 Develop Derby DML and DDL statements to create, manipulate, and report on the contents of a Derby database instance

3.0 The Presentation Tier Of Java Web Applications

- 3.1 Create and test an HTML page that includes Java components
- 3.2 Create a JSP page with an HTML Form

4.0 Introduction to JDBC application programming

- 4.1 Describe the essential JDBC API calls, their usage, and their parameters
- 4.2 Describe the differences between various types of JDBC drivers
- 4.3 Develop, test and debug a Java native JDBC console application using a Derby network database

5.0 Foundations of Java Hibernate applications

- 5.1 Describe the concepts of object-relational mapping as supported by Hibernate
- 5.2 Produce a mapping between relations in a Derby database and ordinary Java classes (POJOs) using XML configuration files
- 5.3 Develop applications that persist and query data via Hibernate's HQL language
- 5.4 Explain the persistence model used by Hibernate, Hibernate's caching strategies, and its impact on database concurrency control
- 5.5 Develop Java EE components that utilize the traditional Hibernate APIs to persist data in a Derby database

6.0 Introduction to the Java Persistence API (JPA)

- 6.1 Produce object-relational mappings using the Java EE JPA annotations supported by Hibernate
- 6.2 Develop, test and debug Java EE applications using JPA annotations and interfaces.

7.0 Enterprise Java Beans (EJBs)

- 7.1 Describe different types of Java Enterprise beans, the commonly-used APIs and annotations (injection, JNDI) and how Java EE beans can be packaged within a Java application.
- 7.2 Develop stateless and stateful session Java Enterprise beans

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8.0 Java EE RESTful Web Services

- 8.1 Describe the component architecture of JAX-RS web services.
- 8.2 Develop a simple, read-only JAX-RS web service.

9.0 Creating complete Java EE web applications

- 9.1 Create and deploy EJB session beans in a 3-tiered applications using JPA for the data access layer.
- 9.2 Create a Java servlet to manage a session for a 3-tiered Java EE web application
- 9.3 Develop, test and debug a web-based Java EE JPA application that permits pagination through multiple web page displays

Required Student Resources

Dr. Danny Coward. Java EE 7: The Big Picture (2015). McGraw-Hill (Oracle Press).

Hibernate and JPA documentation are provided as part of the Hibernate installation package. Additional handouts will be provided as necessary.

Optional Student Resources

Christian Bauer, Gavin King, and Gary Gregory. Java Persistence with Hibernate (2nd). Manning Publications.

Nicholas S. Williams. Professional Java for Web Applications (2014). Wrox (John Wiley and Sons).

Jendrock, Cervera-Navarro, Evans, Haase, Markito. The Java EE 7 Tutorial - Volumes 1 and 2 (5th). Addison-Wesley.

Mike Keith and Merrick Schincariol. Pro JPA 2: Mastering the Java Persistence API. (1st). Apress Books, Berkeley, California..

David R. Heffelfinger. Java EE 7 with Glassfish 4 Application Server. Packt Publications.

Antonio Goncalves. Beginning Java EE6 Platform with Glassfish 3: From Novice to Professional (2nd). Apress Books, Berkeley, California..

Java EE 7 Tutorial web page: http://docs.oracle.com/javaee/7/tutorial/doc/

Evaluation

The minimum passing grade for this course is 55 (D).

In order to successfully complete this course, the student is required to meet the following evaluation criteria:

Final Examination	35.00
Midterm Examination	15.00
Group Assignments (3@10%)	30.00
Exercises (4@5%)	20.00
	100.00 %

Other

Conestoga College is committed to providing academic accommodations for students with documented disabilities. Please contact the Accessibility Services Office.

Prepared By Glenn Paulley

School Information Technology

Date 2016-11-25

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