

CS333

Enterprise Applications with Java

[Onsite]

Course Description:

This course discusses the development of distributed applications using Java 2 Enterprise Edition (J2EE) libraries by addressing key technologies such as Servlets, Java Server Pages, Hibernate and Spring.

Prerequisite(s) and/or Corequisite(s):

Prerequisites: CS111 Client-Side Web Scripting or equivalent, CS300 Application Design or equivalent, CS330 Database Design and Implementation or equivalent

Credit hours: 4

Contact hours: 50 (30 Theory Hours, 20 Lab Hours)

Syllabus: Enterprise Applications with Java

Instructor: _____

Office hours: _____

Class hours: _____

Major Instructional Areas

1. Client/server applications
2. Java Server Pages (JSP)
3. Servlets
4. The Model View Controller (MVC)
5. Java Database Connectivity (JDBC)
6. JSP Standard Tag Library (JSTL)
7. Struts Framework
8. Spring Framework
9. Hibernate

Course Objectives

1. Implement an application server such as Tomcat.
2. Develop J2EE applications by either Eclipse or NetBeans.
3. Describe tools used to build J2EE Web applications.
4. Develop servlets for Web applications.
5. Use servlets to handle client requests and server responses.
6. Develop JSP for Web applications.

7. Build Java codes with JSP scripting elements.
8. Apply the Model View Controller (MVC) pattern to develop a Web application with JavaBeans.
9. Design Web-based client/server applications that connect to databases with MS Access or MySQL.
10. Use custom JSP Tags or JSTL to build J2EE Web applications.
11. Explain how different frameworks are implemented for J2EE applications.

SCANS Objectives

SCANS is an acronym for Secretary's Commission on Achieving Necessary Skills. The committee, created by the National Secretary of Labor in the early 1990s, created a list of skills and competencies that the committee feels are necessary for employees to function in a high-tech job market.

1. Acquire and evaluate information.
2. Know how technological systems work and operate effectively.
3. Demonstrate competence in understanding systems.
4. Know how a system's structure relates to goals.
5. Demonstrate competence in selecting technology including determining desired outcomes and applicable constraints.
6. Demonstrate competence in how to apply technology to task.
7. Work cooperatively with others and contribute to group with ideas, suggestions, and effort.
8. Employ computers to acquire, organize, analyze, and communicate information.

Course Outline

Note: All graded activities, except the Project, are listed below in the pattern of <Unit Number>.<Assignment Number>. For example, Lab 5.1 refers to the 1st lab activity in Unit 5.

| Unit | Activities |
|--|---|
| <p>1–</p> <p>Overview of Servlets and JSP</p> | <ul style="list-style-type: none"> • Content Covered: <ul style="list-style-type: none"> <i>Core Servlets and JavaServer Pages Volume 1: Core Technologies:</i> <ul style="list-style-type: none"> ○ Chapter 1, “An Overview of Servlet and JSP Technology” ○ Chapter 2, “Server Setup and Configuration” ○ Chapter 19, “Creating and Processing HTML Forms” ○ Appendix, “Server Organization and Structure” • Assignments: 1.1 • Labs: 1.1-1.3 |
| <p>2–</p> <p>Developing Servlets with Client Request and Server Response</p> | <ul style="list-style-type: none"> • Read from <i>Core Servlets and JavaServer Pages Volume 1: Core Technologies:</i> <ul style="list-style-type: none"> ○ Chapter 3, “Servlet Basics” ○ Chapter 4, “Handling the Client Request: Form Data” ○ Chapter 5, “Handling the Client Request: “HTTP Request Headers” ○ Chapter 6, “Generating the Server Response: HTTP Status Codes” ○ Chapter 7, “Generating the Server Response: HTTP Response Headers” • Project: Part 1 • Labs: 2.1-2.3 |
| <p>3–</p> <p>Working with Cookies and Sessions</p> | <ul style="list-style-type: none"> • Read from <i>Core Servlets and JavaServer Pages Volume 1: Core Technologies:</i> <ul style="list-style-type: none"> ○ Chapter 8, “Handling Cookies” |

| Unit | Activities |
|--|---|
| | <ul style="list-style-type: none"> ○ Chapter 9, "Session Tracking" ● Assignments: 3.1 ● Labs: 3.1-3.2 |
| 4— Overview of JSP Technology | <ul style="list-style-type: none"> ● Read from <i>Core Servlets and JavaServer Pages Volume 1: Core Technologies</i>: <ul style="list-style-type: none"> ○ Chapter 10, "Overview of JSP Technology" ○ Chapter 11, "Invoking Java Code with JSP Scripting Elements" ○ Chapter 12, "Controlling the Structure of Generated Servlets: The JSP Page Directive" ○ Chapter 13, "Including Files and Applets in JSP Pages" ● Assignments: 4.1 ● Project: Part 2 ● Labs: 4.1-4.3 |
| 5— Using JavaBeans in JSPs | <ul style="list-style-type: none"> ● Read from <i>Core Servlets and JavaServer Pages Volume 1: Core Technologies</i>: <ul style="list-style-type: none"> ○ Chapter 14, "Using JavaBeans Components in JSP Documents" ● Assignments: 5.1 ● Labs: 5.1-5.3 |
| 6— Working with Databases and using MVC in JSPs | <ul style="list-style-type: none"> ● Read from <i>Core Servlets and JavaServer Pages Volume 1: Core Technologies</i>: <ul style="list-style-type: none"> ○ Chapter 15, "Integrating Servlets and JSP: The Model View Controller (MVC) Architecture" ○ Chapter 17, "Accessing Databases with JDBC" ○ Chapter 18, "Configuring MS Access, MySQL, and Oracle9i" |

| Unit | Activities |
|---|--|
| | <ul style="list-style-type: none"> • Assignments: 6.1 • Project: Part 3 • Labs: 6.1-6.8 |
| <p>7–</p> <p>Creating Custom JSP Tag Libraries and using JSTL</p> | <ul style="list-style-type: none"> • Read from <i>Core Servlets and JavaServer Pages Volume 1: Core Technologies</i>: <ul style="list-style-type: none"> ○ Chapter 16, “Simplifying Access to Java Code: The JSP 2.0 Expression Language” • Read from <i>Core Servlets and JavaServer Pages Volume 2: Advanced Technologies</i> > ITT Tech Virtual Library > School of Study > School of Information Technology > Selected Textbooks > CS333 Enterprise Application with Java [Hall, Ch 7-12]: <ul style="list-style-type: none"> ○ Chapter 7, “Tag Libraries: The Basics” ○ Chapter 8, “Tag Libraries: Advanced Features” ○ Chapter 9, “JSP Standard Tag Library (JSTL)” • Project: Part 4 (Assigned) • Labs: 7.1, 7.2 |
| <p>8–</p> <p>Introduction to the Struts Framework</p> | <ul style="list-style-type: none"> • Read from <i>Core Servlets and JavaServer Pages Volume 2: Advanced Technologies</i> > ITT Tech Virtual Library > School of Study > School of Information Technology > Selected Textbooks > CS333 Enterprise Application with Java [Hall, Ch 7-12]: <ul style="list-style-type: none"> ○ Chapter 10, “The Struts Framework: Basics” ○ Chapter 11, “The Struts Framework: Doing More” ○ Chapter 12, “The Struts Framework: Validating User Input” • Project: Part 5 (Assigned) • Labs: 8.1-8.3 |
| <p>9–</p> <p>Introduction to the</p> | <ul style="list-style-type: none"> • Read from ITT Tech Virtual Library > Books > Books24x7 > |

| Unit | Activities |
|---|--|
| Spring Framework | <p data-bbox="586 260 997 291"><i>Beginning Spring Framework 2:</i></p> <ul style="list-style-type: none"> <li data-bbox="683 323 1279 354">○ Chapter 1, “Designing Spring Applications” <li data-bbox="683 386 1149 417">○ Chapter 2, “Jump Start Spring 2” <li data-bbox="683 449 1295 522">○ Chapter 4, “Using Spring MVC to Build Web Pages” <ul style="list-style-type: none"> <li data-bbox="537 554 932 585">● Project: Part 4 (Submitted) <li data-bbox="537 617 802 648">● Assignments: 9.1 <li data-bbox="537 680 753 711">● Labs: 9.1-9.2 |
| 10– Introduction to Hibernate and JPA | <ul style="list-style-type: none"> <li data-bbox="537 758 1321 831">● Read from ITT Tech Virtual Library> Books> Books24x7> <i>Beginning Hibernate: From Novice to Professional:</i> <ul style="list-style-type: none"> <li data-bbox="683 863 1279 894">○ Chapter 1, “An Introduction to Hibernate 3” <li data-bbox="683 926 1377 957">○ Chapter 2, “Integrating and Configuring Hibernate” <li data-bbox="683 989 1268 1020">○ Chapter 3, “Building a Simple Application” <li data-bbox="537 1052 818 1083">● Assignments: 10.1 <li data-bbox="537 1115 716 1146">● Labs: 10.1 |
| 11– Course Review and Final Exam | <ul style="list-style-type: none"> <li data-bbox="537 1194 781 1226">● Course Review <li data-bbox="537 1257 727 1289">● Final Exam <li data-bbox="537 1320 927 1352">● Project: Part 5 (Submitted) |

Instructional Methods

In this course, you will be introduced to commonly used components of Java 2 Platform, Enterprise Edition (J2EE) and will be given opportunities to create Web applications in servlets and JSPs. This course employs learning and evaluating strategies such as assignments, labs, a project, and a final exam to help you comprehend the aspects of data structures.

Labs and projects offer significant hands-on practice. Units 1 through Unit 10 include at least one lab exercise to reinforce the content specific to that unit. Programming assignments require you to apply concepts that were presented earlier in the course to later units.

Unit 11 includes the final exam that evaluates your understanding of all the concepts covered in Units 1 through 8. Project: Part 4 and Part 5 will evaluate your understanding of Units 9 through 10.

Instructional Materials and References

Student Textbook Package

- Hall, Marty, and Larry Brown. *Core Servlets and JavaServer Pages: Volume 1: Core Technologies*. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 2004.
- CD-ROM: NetBeans IDE6.5: Development Simplified

Other Required Resources

In addition to the student textbook package, the following is also required in this course:

- Hall, Marty, Larry Brown, and Yaakov Chaikin. *Core Servlets and JavaServer Pages: Volume 2: Advanced Technologies*. 2nd ed. Upper Saddle River, NJ: Prentice Hall, 2008. *Chapters 7-12 available in the ITT Tech Virtual Library > School of Study > School of Information Technology > Selected Textbooks > CS333 Enterprise Application with Java [Hall, Ch 7-12].*
- *Beginning Spring Framework 2*. Selected chapters (1, 2, 4) from ITT Tech Virtual Library> Books> Books24x7
- *Beginning Hibernate: From Novice to Professional*. Selected chapters (1, 2, 3) from ITT Tech Virtual Library> Books> Books24x7

References

ITT Tech Virtual Library

Log on to the ITT Tech Virtual Library at <http://library.itt-tech.edu/> to access online books, journals, and other reference resources selected to support ITT Tech curricula.

Books

You may click “Books” or use the “Search” function on the home page to find the following books.

- Books> Books24x7
 - Brown, Simon, et al. *Pro JSP 2. 4th ed. Berkeley, CA: Apress, 2005.*
 - Dudley, Bill, and Jonathan Lehr. *Jakarta Pitfalls: Time-Saving Solutions for Struts, Ant, JUnit, and Cactus. Indianapolis, IN: John Wiley, 2003.*
 - Falkner, Jayson et al. *Beginning JSP Web Development. Berkeley, CA: Apress, 2003.*
 - Haan, Peter, et al. *Beginning JSP 2: From Novice to Professional. Berkeley, CA: Apress, 2004.*
 - Harbourne-Thomas, Andrew, et al. *Professional Java Servlets 2.3. Berkeley, CA: Apress, 2004.*
 - Holmes, James. *Struts: The Complete Reference. 2nd ed. New York: McGraw-Hill/Osborne. 2007.*
 - Kayal, Dhrubojyoti. *Pro Java EE Spring Patterns: Best Practices and Design Strategies Implementing Java EE Patterns with the Spring Framework. Berkeley, CA: Apress, 2008.*
 - Mak, Gary. *Spring Recipes: A Problem Solution Approach. Berkeley, CA: Apress, 2008.*
 - Minter, Dave and Jeff Linwood. *Beginning Hibernate: From Novice to Professional. Berkeley, CA: Apress, 2006.*
 - Myers, Tom, and Alexander Nakhimovsky. *Professional Java XML Programming with Servlets and JSP. Berkeley, CA: Apress, 2003.*
 - Parsian, Mahmoud. *JDBC Recipes: A Problem-Solution Approach. Berkeley, CA: Apress, 2005.*
 - Patzer, Andrew. *Foundations of JSP Design Patterns. Berkeley, CA: Apress, 2004. Pugh, Eric, and Joseph D. Gradecki. Professional Hibernate. Hoboken, NJ: Wrox Press, 2004.*
 - Pugh, Eric, and Joseph D. Gradecki. *Professional Hibernate. Hoboken, NJ: Wrox Press, 2004.*
 - Robinson, Mike, and Ellen Finkelstein. *Jakarta Struts for Dummies. Indianapolis, IN: John Wiley, 2004.*

- Van de Velde, Thomas, et al. *Beginning Spring Framework 2*. Hoboken, NJ: Wrox Press, 2008.
- Vervaet, Erwin. *The Definitive Guide to Spring Web Flow*. Berkeley, CA: Apress, 2008.
- Walnes, Joe et al. *Java Open Source Programming: With XDoclet, JUnit, WebWork, Hibernate*. Indianapolis, IN: John Wiley and Sons, 2004.
- Weaver, James L., Kevin Mukhar, and Jim Crume. *Beginning J2EE 1.4: From Novice to Professional*. Berkeley, CA: Apress, 2004.

Reference Resources

You may click “Reference Resources” or use the “Search” function on the home page to find the following reference resources.

Click School of Information Technology on the home page

- Recommended Links
 - Java World
 - Java Pro
 - Java Tutorials
 - Java.Sun.com: The Source for Java Technology
- Tutorial Links
 - The JSP Resource Index
 - Java Programming Tutorials
 - Programming Tutorials

Other References

The following resources may be found **outside** of the ITT Tech Virtual Library.

Books

- Hall, Marty and Larry Brown. *Core Servlets and JavaServer Pages. 2nd ed.* (E-book in PDF format)

<http://pdf.coreservlets.com/>

- Hall, Marty. *More Servlets and JavaServer Pages. (E-book in PDF format)*

<http://pdf.moreservlets.com/>

Web sites

- The J2EE 5 Tutorial

<http://java.sun.com/javaee/5/docs/tutorial/doc/>

This tutorial uses examples to describe the features and functionalities available in the Java EE 5 platform for developing enterprise applications.

- Coreservlets.com

<http://www.coreservlets.com/>

This site provides a variety of J2EE tutorials, books, and other resources.

- Freewarejava.com

<http://www.freewarejava.com>

[This Web site provides tutorials, applets, and resources for Java, JSP, and JavaScript developers.](http://www.freewarejava.com)

- Java

<http://www.java.com/en/>

[This Web site provides working examples of Java and Java downloads.](http://www.java.com/en/)

- Developer.com

<http://www.developer.com/java/>

[This Web site contains resources for Java developers.](http://www.developer.com/java/)

- TheServerSide.COM

<http://www.theserverside.com/>

[This Web site connects members in an Enterprise Java community through discussion boards and blogs.](http://www.theserverside.com/)

- Javaguru.com

<http://www.javaguru.com/>

This Web site offers information on Java programming, projects, tutorials, courses, and software development.

All links to Web references outside of the ITT Tech Virtual Library are always subject to change without prior notice.

Course Evaluation and Grading

Evaluation Criteria Table

The final grades will be based on the following categories:

| CATEGORY | WEIGHT |
|--------------|-------------|
| Labs | 35% |
| Project | 35% |
| Assignments | 10% |
| Final Exam | 20% |
| Total | 100% |

Note: Students are responsible for abiding by the Plagiarism Policy.

Grade Conversion Table

The final grades will be calculated from the percentages earned in the course, as follows:

| | | |
|----|---------|-----|
| A | 90-100% | 4.0 |
| B+ | 85-89% | 3.5 |

| | | |
|----|--------|-----|
| B | 80-84% | 3.0 |
| C+ | 75-79% | 2.5 |
| C | 70-74% | 2.0 |
| D+ | 65-69% | 1.5 |
| D | 60-64% | 1.0 |
| F | <60% | 0.0 |