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Course Outline for CS 39

JAVA SERVLETS AND JSP

Effective: Fall

I. CATALOG DESCRIPTION:
CS 39 — JAVA SERVLETS AND JSP — 2.00 units

Introduction to basic Java Servlet capabilities as an alternative to Common Gateway Interface (CGI) to create interactive web pages including secure access to the web site, database interactivity, generate dynamic web pages and maintain client session data (i.e. cookies).

1.50 Units Lecture 0.50 Units Lab

Prerequisite
CS 31 - Java Programming

CS 37 - Web Programming
with a minimum grade of C

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	27.00
Lab Hours:	27.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. CS31
B. CS37
1. GENERIC: These outcomes are being developed throughout the entire programming sequence. Upon completion of the course, to an intermediate level, students should be able to: Programming Skills
2. present the elements and features of the website development environment;
3. define and explain trends in HTML/JavaScript standards;
4. write, compile, test and debug scripts within an HTML document;
5. present the characteristics of object-oriented programming using JavaScript;
6. define and use data types and variables in JavaScript;
7. define and use constructors in JavaScript functions;
8. define and use inheritance mechanisms in Cascading Style Sheets (CSS);
9. define and use user interfaces using the HTML form tags;
10. define and use file Input/Output (I/O) in JavaScript;
11. define and develop class modules under CSS;
12. develop and use event-driven applications (HTML, form tags, JavaScript);
13. Documentation
14. write in a concise and precise form appropriate for technical documentation;
15. Testing and Debugging
16. develop testing procedures;
17. test programs, and document errors and solutions;
18. User Interface Design
19. define the requirements for the user interface in a typical eCommerce website;
20. Problem Solving
21. use a wide range of troubleshooting methods and tools to isolate problems;
22. select the appropriate approach to identify causes of the problem based on the given situation;

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Several of these outcomes are being developed throughout the entire programming sequence. Upon completion of the course, to an intermediate level, students should be able to: Programming Skills

1. Explain and apply the fundamental concepts of Java Servlets vs. Common Gateway Interface (CGI)
2. Present the elements and features of the Java Servlet environment (security, data I/O)
3. Explain and use the design process for a servlet
4. Define and use decision and repetition structures
5. Define and use functions and storage classes
6. Use operators and functions
7. Define and use dynamic data structures
8. Define and explain trends in Java programming standards
9. Write, compile, test and debug programs
10. Present the characteristics of object-oriented programming under Servlets
11. Define and use Java data types and variables
12. Define and use arrays
13. Define and use Java function overloading
14. Define and use user HTML interfaces
15. Define and use file I/O under Java Servlets
16. Develop and use event-driven Servlet programs
17. Define the use of “cookies”

B. Technical Documentation
1. Write in a concise and precise form appropriate for technical documentation
2. Explain and use the processes and techniques of technical documentation
3. Record system specifications accurately and completely

C. Testing and Debugging
1. Select debugging and testing methodology, and develop comprehensive and systematic test plan
2. Develop testing procedures
3. Conduct tests in the most efficient way
4. Test programs, and document errors and solutions

D. User Interface Design
1. Define the requirements for the user interface
2. Detail the development process and methods best suited for the project
3. Develop user interface (UI) to meet user requirements
4. Test UIs

E. Problem Solving
1. Recognize a wide range of problems, and assess their impact on the system
2. Use a wide range of troubleshooting methods and tools to isolate problems
3. Select the appropriate approach to identify causes of the problem based on the given situation

V. CONTENT:
A. Review of Java grammar and syntax
B. Review of static HTML tags and web pages
C. Introduction to networking basic concepts
D. Overview of the Java Servlet Developer Kit (JSDK) and API
E. Comparison of Servlets and Common Gateway Interface
F. HTTP Get and Post Requests
G. Session tracking with HTTP Sessions
H. Java Database Connectivity (JDBC)
I. Java Remote Method Invocation (RMI) overview
J. Form Processing
K. Cookies concepts and maintaining client data
L. Basic setting up and administering Servlets on a server

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. **Demonstration** -
C. **Projects** - Optional: Programming project completed in teams
D. **Lab** - Lab Programming Assignments
E. **Discussion** -

VII. TYPICAL ASSIGNMENTS:
A. Create a servlet that will: 1. Project a web site that ask you to select a favorite vacation spot (i.e. Hawaii, Florida, Mexico, Europe, Caribbean, etc. 2. The web site will use static HTML radio buttons to select your choice. Use static HTML buttons for “Submit” and “Clear”. Depending on what you select, display an appropriate graphic image (jpg or gif). 3. Use Where HTTPPostServlet is the name of the java servlet. 4. Based on the responses, display the percentage of the responses per each choice on a return HTML page generated by this servlet. 5. Make sure that the servlet services have been started before executing. Remember the compiled .class file is located on the server system or (if you are using the SUN JSDK: Jswdk-1.0.1/webpages/WEB-INF/servlet/) 6. Rewrite exercise A to use session tracking.

VIII. EVALUATION:
A. **Methods**

B. **Frequency**

1. Frequency of evaluation
   a. Recommend 2 or 3 exams plus final examination
   b. Recommend programming assignment to cover each topic within course content. Contents can be combined.
2. Types of Exam Questions
   a. Write an HTML form tag to input a customer name from the keyboard.
   b. What is the command to execute a perl script? What would cause a valid script program not to run?
   c. Write the command to create and array of integers of size 10 and initialize each element to –1.

IX. TYPICAL TEXTS:

1. Deitel and Deitel, *Java How to Program.* 3rd ed., Prentice Hall, 1999.
2. Bruce Eckel *Thinking n Java*., Prentice Hall, 2000.
3. Michael Daconta, Al Saganich and Eric Monk *Java 2 and Javascript for C and C++ Programmers.*, John Wiley & Sons, Inc., 1999.
4. Due to the current “newness”and “cutting edge” of Java Servlets, there are few books devoted to this subject. As in any “cutting edge” topic, most books are extremely technical and designed for a professional readership that is currently working with the subject and not an inexperienced, academic (student) based readership. Most information dealing with Servlets are part of comprehensive Java text or web sites. The course should be part of a continuing series in Java instruction with this topic using an existing text.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Software 1. Standard, current Java System Developer's Kit (SDK) installed on the institution's lab stations. 2. Current GUI Java compiler/editor such as Borland's JBuilder or Symantec Java Cafe. 3. Current version of Microsoft Internet Explorer and Netscape Navigator to test Servlets. 4. Sun Microsystems Java Servlet Development Kit (JSDK) 5. Compatible JSDK web server such as Netscape Communicator's Web server, Microsoft's Internet Information Server (IIS), World Wide Web Consortium's Jigsaw, freeware Apache Web server. Sun Microsystems' Java Web Server with the JSDK built in. 6. Current Microsoft operating system (Microsoft NT 4 or 2000) on the institution's lab "client" machines and server. Solaris UNIX system if the lab is UNIX based.

B. Equipment 1. Aside from a standard server and multiple client stations, an optional lab student server to hold student projects (i.e. servlets and associated HTML web pages)