

Java Programming & Building Web Sites Using Java Server Pages and Servlets

Location: Maynard Library Time: 4:00 to 6 PM Thursday Evenings

Days: Starting Jan 14 2010. It will go for about ten sessions though some weeks may be skipped in case of bad weather, health issues, etc.

Anyone interested in a good overview of object based programming using Java is welcome to attend this free course. Java is used at many colleges and this overview may be of interest to college bound engineering students. Web designers moving to Java Web technologies from PHP or ASP should find this material interesting. Programmers seeking jobs may welcome this review.

Go to www.cdhconsult.com/course to register and for more information.

Course description and format:

Java is a powerful modern programming language. In the web site area, Java is not only the server side programming language but the web server itself (Tomcat) is written in Java and the Netbeans IDE is also written in Java.

Typically the first half of the session will be spent on Java Language topics and the second half on web site topics. Both topics are vast and the pace will be fast. This overview course is an appetizer and roadmap for further detailed study. We will do just enough HTML, CSS, JavaScript and MySQL stuff to support the primary focus of the course which is Java, JSTL, EL, and Java Swing GUI's. We will learn by doing and will go into the minutia as needed rather than study a lot of detailed syntax and semantic rules. In general anything about Java can be found on the Internet using Google, but see the book list for some great books. All software tools used in the course are freely available on the Internet for Window's, Linux, and Macintosh PCs. These include the Netbeans IDE, the Tomcat web server, and the MySQL database server. The class sessions will use PowerPoint slides and demos with an interactive question and answer style. We will meet in the large comfortable Roosevelt room at the new Maynard Library.

Java Topics

- How to get and install the JVM, the Java virtual machine, on your PC. We want the JDK from java.sun.com not just the JRE from java.com. How to get and use the Netbeans IDE. How to create, compile, build, and deploy Java web and desktop applications.
- Java basics; strong data typing, packages, flow of control, variables, classes and interfaces, references or handles, standard libraries, garbage collection, exception handling
- Data structures; Arrays, Lists, Trees, Queues, Maps. The Java Collections package. Java Generics.

- Object Oriented versus Object Based Programming concepts; encapsulation of data, inheritance, polymorphism, and abstraction. The isA versus hasA object design strategy.
- Java Beans: POJO's. Java XML persistence mechanism uses java beans. Making in Netbeans IDE.
- Multi-threaded applications – often used in GUI's. Producer-Consumer designs and queues.
- GUI's – The Swing Framework. Building GUI's using Netbeans Matisse GUI builder.
- RestFul web service and using the JDOM library to create XML documents.
- Java Reflection or Introspection if time permits

Web Site Topics

- Web site language stew – HTML, CSS, JavaScript, DOM (Document Object Model) versus the browsers – IE, FireFox, Safari, Opera.
- The Tomcat server – where to get it, how to use it, where to find hosting sites, the web.xml, users.xml, and server.xml configuration files (It is included with NetBeans too). How to make your own SSL certificate and install it in Tomcat.
- How to get and install the MySQL database server. Create data bases and configure users.
- Overview of servlets – they must be thread safe.
- Java server Pages – servlets in disguise
- Web site workflow; how can change the browser page with links, redirection, forwarding, and JavaScript. How to use a GateKeeper.jsp to switch from http to https.
- The JSTL, Java Standard Tag Language and the Expression Language (EL)
- JDBC – how to connect to a MySQL or other relational data base and use connection pooling.
- DB tools: Deziign for DB, MySQLNavigator, SQLyog.
- Tiling web pages using JSTL and the EL – this is very powerful technique
- AJAX – Asynchronous JavaScript and XML. Also JASON (JavaScript Object Notation) and various JavaScript libraries like JQuery time permitting
- The UrlRewrite filter – how to make search engine friendly URL's

The course registration web application will serve as the basis for our web site example. It will include both JSP's and Servlets, show how to access a MySQL DB with JDBC, tiling using the JSTL, and sending confirmation emails from the web site using a 3rd party jar library. Also we will use Java threads in a Singleton pattern to queue up confirmation emails so the web site is responsive.

Not Covered

We will not cover other web site frameworks or languages. E.g. Struts, Struts2, Tapestry, Java Server Faces, Spring, Hibernate, Groovy, JRuby, PHP, Python, Anything Microsoft like C#. We will not cover other IDE's like Eclipse (unless we can find a guest speaker) or IntelliJ IDEA.

The Instructor

Charlie Havener has been developing software for over 30 years, holds MSEE from Cornell and an MSCS degree from BU. He is a Sun Certified Java Programmer. He has taught programming courses at Boston

and Northeastern University in the State-of-the-Art program. He has been a free lance software and web site developer for six years at www.cdhconsult.com in Maynard.

How to take this course

You may just observe, actively participate with questions, or you may try some of the suggested exercises from week to week and get help during the class session. The tools are large and powerful (especially Netbeans) and need a PC with lots of memory and speed. You may bring a laptop if you wish or try running things on your home or school PC. Various files and examples will be available over the Internet from time to time. The Library has excellent Wi-Fi.

Registration

Please register with your email address at <http://www.cdhconsult.com/course>. We need at least fifteen people to run the course. You will be notified by email if a session must be postponed for any reason.

Java Essentials Programming Book List

- The Java Programming Language 4th Edition by Ken Arnold, James Gosling, David Holmes – 2005, Sun Microsystems. (This book covers the syntax and semantics of core Java but does not have compelling examples)

Java and OOP Advanced Book List

- Effective Java 2nd Edition by Joshua Bloch, 2008, Sun Microsystems.
- Java Concurrency in Practice by Brian Goetz et al, 2006, Addison Wesley
- Holub on Patterns by Allen Holub, 2004, Apress (An excellent OOP book, highly recommended)
- Java Generics and Collections by Naftalin & Wadler, 2007, O'reilly
- Hardcore Java by Robert Simmons, 2004, O'reilly
- Swing 2nd Edition by Robinson and Vorobiev, 2003, Manning; and/or Definitive Guide to Swing 2nd or 3rd Edition by John Zukowski.
- Swing Hacks: Tips and Tools for Killer GUIs by Marinacci and Adamson, 2005, O'reilly

Web Site Topics Book List

- Java Servlet Programming by Jason Hunter, 2003, O'reilly.
- JSTL in Action by Shawn Bayern, 2003, Manning.
- HTML - The definitive guide, O'reilly
- CSS - The definitive guide, O'reilly
- JavaScript – The definitive guide, O'reilly
- Tomcat – The definitive guide, O'reilly
- High Performance Web Sites by Steve Souders, 2007, O'reilly
- MySQL 4th edition by Paul DuBois, 2008, Addison Wesley