

Instructor: Yusuf Ozbek <yozbek@coe.neu.edu>

### Description:

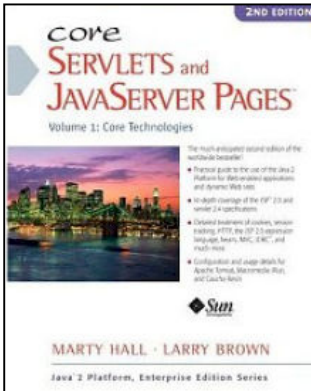
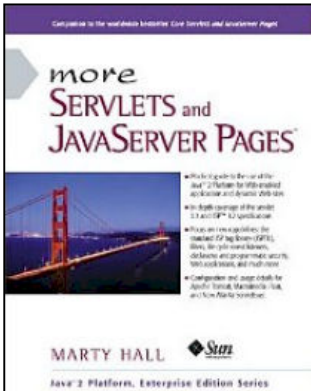
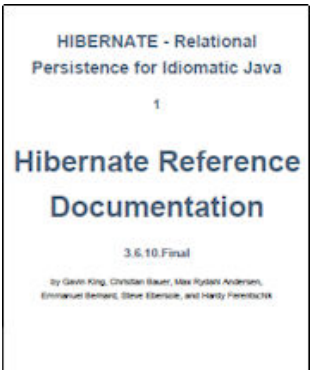

Explores advanced server-side technologies and tools necessary to design and engineer complete web-based enterprise applications quickly. Designed to build on previous experience in the Application Engineering and Development course to cover the life-cycle of a web based application. The main focus of this class is Spring MVC and Hibernate to build server-side, database intensive, and multi-tier web applications. Additionally, designing Rich Internet Applications (RIA) using AJAX, and Service-Oriented Architecture (SOA) using REST will also be discussed. Even though the choice of RDBMS is MySQL in this class, connecting to Oracle and MSSQL Server will also be discussed.

**Prerequisites:** Graduate level INFO 5100 Minimum Grade of C- or Undergraduate level INFO 5100 Minimum Grade of D- or Graduate level CSYE 6200 Minimum Grade of C-

### Objectives:

- Design and build web applications using Spring MVC and Hibernate
- Learn JSTL and other Custom Tag Libraries and design web pages
- Learn how to process web client requests Asynchronously using AJAX and DWR
- Learn Velocity, and FreeMarker to generate dynamic HTML Web pages, particularly by Spring MVC applications following the MVC pattern.

**References:** No textbook is selected for this class due to a number of different subjects covered, but there are several free eBooks that will be used as reference materials in addition to lecture slides.

<p><b>Core Servlets and JSP</b> eBook: <a href="http://pdf.coreservlets.com">http://pdf.coreservlets.com</a></p> 	<p><b>More Servlets and JSP</b> eBook: <a href="http://pdf.moreservlets.com">http://pdf.moreservlets.com</a></p> 	<p><b>Spring MVC Reference Manual</b> eBook: <a href="http://hibernate.org/orm/documentation">http://hibernate.org/orm/documentation</a></p> 	<p><b>Hibernate Reference Manual</b> eBook: <a href="http://spring.io/docs">http://spring.io/docs</a></p> 
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### Tentative Grading Policy:

Assignments: 10%  
Lab Quizzes: 10%-20%  
Midterm: 20-30%  
Final Project: 20-30%  
Final Exam: 20-30%

### Tentative Course Outline

#### Lecture 1.1 – Client-Side vs. Server-Side

- ☐ Internet Philosophy and approach
- ☐ Internet Protocols IP/TCP/UDP and comparisons
- ☐ Domain names and DNS Services
- ☐ HTTP protocol and HTTPS
- ☐ Web Servers Vs. Application Servers
- ☐ Client/Server Model vs Peer model of computing

#### Lecture 1.2 – Introduction to Servlets

- ☐ The Advantages of Servlets Over “Traditional” CGI
- ☐ Basic servlet structure, and generating pages dynamically
- ☐ Requests and Responses
- ☐ Handling the Client Request: Form Data
- ☒ **Self Study: JavaScript, JSON, and AJAX**

## Lecture 2.1 – Overview of JSP Technology

- ☐ The need for JSP
- ☐ Benefits of JSP
- ☐ Basic JSP Syntax

☒ **Self Study: DWR & JQuery**

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## Lecture 2.2 – Session Management

Session management is a mechanism to maintain state about a series of requests from the same user across some period of time. That is, the term "session" refers to the time that a user is at a particular web site. The problem is that HTTP has no mechanism to maintain state. Individual requests aren't related to each other. The Web server can't easily distinguish between single users and doesn't know about user sessions. Session management refers to the way that associate data with a user during a visit to a Web page.

☒ **Self Study: Expression Language**

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## Lecture 3 – Integrating Servlets and JSP: The Model View Controller (MVC) Architecture

- ☐ Understanding the benefits of MVC
- ☐ Using RequestDispatcher to implement MVC
- ☐ Forwarding requests from servlets to JSP pages
- ☐ Forwarding requests from JSP pages
- ☐ Including pages instead of forwarding to them

☒ **Self Study: JSTL**

☒ **Self Study: Custom Tags**

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## Lecture 4 – Introduction to Spring MVC

- ☐ Getting started with Spring MVC
  - ☐ Mapping Requests to Controllers
  - ☐ Handling Requests with Controllers
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## Lecture 5 – Rendering Web views

- ☐ Resolving views
- ☐ Using JSP Templates
- ☐ Working with JSP alternatives
- ☐ Generating non-HTML output, Producing Excel spreadsheets, Generating PDF documents

☒ **Self Study: Tiles**

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## Lecture 6 – Spring Form Controllers and Validators

☒ **Self Study: Velocity**

☒ **Self Study: FreeMarker**

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## Lecture 7 – Persisting Objects with Hibernate

## Lecture 8 – Mapping persistent classes

## Lecture 9 – Mapping collections and entity associations

☒ **Self Study: Java Annotations and Annotation-Based Mapping**

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## Lecture 10 – Conversational Object Processing

- ☐ Working with Objects
  - ☐ Transactions
  - ☐ Optimizing fetching and Caching
  - ☐ Advanced Query Options
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## Lecture 11 – Core J2EE Patterns – DAO (Data Access Object)

## Lecture 12 – Spring WebFlow

☒ **Self Study: REST**

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## Lecture 13, 14 – Advanced Spring MVC Concepts or other MVC Frameworks

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### Policy on Academic Dishonesty:

Occurrences of academic dishonesty, such as copying and the submission of work that is not the student's own, will be dealt with according to the NEU's and COE's policies on academic dishonesty. In addition, students who allow their files or assignments to be copied are as guilty of academic dishonesty as those who copy and will be treated accordingly. Each student is responsible for taking reasonable precautions to ensure that his/her work is not available for unauthorized use. Students stealing or passing off class work as one's own will fail the class, and risk suspension from the MSIS program. Essential to the mission of Northeastern University is the commitment to the principles of intellectual honesty and integrity. Academic integrity is important for two reasons. First, independent and original school work ensures that students derive the most from their educational experience and the pursuit of knowledge. Second, academic dishonesty violates the most fundamental values of an intellectual community and depreciates the achievements of the entire University community. It is extremely important that the student understand that Northeastern University views academic dishonesty as one of the most serious offenses that a student can commit while in college. It is the student's responsibility to know and follow these standards/codes of ethics, which are part of the student's academic program. Please take the time to read what constitutes dishonesty and what the University is willing to do to respond to such incidents: <http://www.northeastern.edu/osccr/academichonesty.html>