Web Application Architecture
Unity and Diversity

CS545

Rujuan Xing, M.S.

Web Application Architecture

Course Overview

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Theme I: Server Side Programming with Spring Boot - Every Action has a Reaction						
Week 1	WAA & Spring Boot Intro	Spring MVC	Restful Web Services	Persistence Intro	Hibernate Inheritance	Spring Data
Theme II: Spring Security - Order is Present Everywhere						
Week 2	Spring Security I	Spring Security II	Review	Midterm	JS Intro	Workshop
Theme III: Client Side Programming – Faster Reaction Time						
Week 3	React Intro	Hooks	Routing	Redux	Project Intro	Project
Theme IV: Integrating all parts together - The Whole is Greater than the Sum of the Parts						
Week 4	Project	Project	Project Presentation	Final Exam		

CS545
Web Application Architecture
Unity and Diversity

A dominant feature of the World Wide Web that has made it the most successful computing platform on the planet is that there is a single unifying protocol that underlies and connects all applications running on the WWW throughout the entire world. The Hypertext Transfer Protocol (HTTP) is used by all servers and browsers on the WWW. HTTP is a simple set of rules that allows every one of the billions of hosts running on the WWW to have access to every other host. It is this simple underlying unification mechanism that has made web applications the predominant form of delivery for modern software applications.

Web applications are an example of a system of almost infinite diversity and complexity that has arisen based on an underlying unifying mechanism. This is a concrete computing example of a similar law of nature from the science of physics and Maharishi's Science of Consciousness. In physics all the diversity of the physical world arises from the underlying *unified field* of physics. In the 1970's and 1980's physicists traced all forces in the universe back to four fundamental forces or fields of nature (gravity, electromagnetic, weak and strong nuclear forces). Now these four fields are integrated into a single field known as the unified field. According to Maharishi's science of consciousness this unified field is the same as the field of pure consciousness or pure awareness that we experience in our daily practice of the Transcendental Meditation Program.

When our thoughts and actions are connected to this level of pure consciousness, they are naturally in accord with the laws of nature guiding the entire universe. They will tend to be successful like the WWW's success in becoming the predominant computing platform in the world.

Course Goals
This course provides a systematic introduction to programming interactive and dynamic web applications for individuals with little or no prior web application programming experience.
At the completion of the course, you will be proficient in designing and writing the following:
- Spring Boot simplifies and accelerates the development of production-ready Java applications.
- Spring Data provides a consistent and convenient way to access and work with various data sources.
- Spring Security as a powerful and customizable authentication and authorization framework.
- React.js for building user interfaces that allows developers to create interactive and dynamic web applications with a component-based architecture.

Course Objectives
- Gain a deep understanding of web application architecture principles.
- Learn how to design scalable and maintainable web applications.
- Master the use of modern technologies and frameworks for web development.
- Build hands-on experience through practical exercises and projects.

- Be equipped to make informed decisions about technology stacks and architecture choices for your web projects.

How You Will Accomplish the Objectives
Preview the slides and reading, attend lectures, complete readings, and ask and answer in-class questions.

How You Will Demonstrate You Have Accomplished the Objectives
Complete homework labs and write small applications on exams.

Course Texts

Head First Servlets and JSP (Passing the Sun Certified Web Component Developer Exam)
by Bryan Basham, Kathy Sierra, Bert Bates
ISBN: 0596005407
Edition: 1st or 2nd edition Publisher: O'Reilly Media, Inc.

Spring MVC: Beginner's Guide
by Amuthan G
ISBN: 9781785880636
Packt Publishing; 2nd edition (2016)

Spring in Action, Sixth Edition
by Craig Walls
ISBN-10: 1617297577
ISBN-13 : 978-1617297571

Learning React, 2nd Edition
Alex Banks, Eve Porcello
ISBN: 9781492051725
Publisher: O'Reilly Media, Inc. (2020)

Class Attendance

Attendance at all classes is required, because all elements of class — lectures, questions and answers, discussions, laboratory work — contribute to the learning process. Absences are usually excused only if you are sick in bed or have a family emergency.

If you must miss a class, please let your instructor know ahead of time. Call, send an email, or send a note with a friend. There is no such thing as a "personal day." If you have personal business to take care of, please schedule it for after class or during the days between blocks. At the same time, it may occasionally be necessary for you to miss a class (or part of a class) for some reason other than illness or family emergency. Please speak with the instructor beforehand, who will be open to considering your needs.

The first lesson of each course is the most important. Students are expected to be present from the first lesson onward. Any student not present on the first morning (except for such compelling reasons as illness or family emergency) may be asked to withdraw from the course. Unexcused absences may result in the student receiving a grade of NC (No Credit) for the whole course.

Evaluation Criteria

Midterm Exam	40%
Final Exam	40%
Labs	8%
Project	10%

Attendance
 	
   - Must attend the class in the classroom.
   - Only sick leave with doctor's note is allowed, all other cases will treated as absence.
	2%

We will use the following grading scale:

Range	Letter Grade
93-100	A
90 - 92	A-
87 - 89	B+
83 - 86	B
80 - 82	B-
77 - 79	C+
73 - 76	C
70 - 72	C-
0 - 69	NC