

Course Syllabus

[Jump to Today](#)

Developing Enterprise Java Applications with Spring Boot and Microservices

Instructor: Rahul Agarwal

Course Description

Spring Framework is a popular full-stack Java application framework that simplifies enterprise application development and promotes good programming practices by offering a set of highly powerful and independent services. Spring Boot makes it even easier to create Spring applications with intelligent defaults to get you started quickly. Hibernate is a high-performance and mature object relational mapping (ORM) framework based on a solid implementation of the Java Persistence API (JPA). Microservices are an evolving system architecture design and continues with the Service Oriented Architecture (SOA) to handle the diversity of devices, heterogeneous systems and the complexity of business logic seen in enterprise applications today. Major Internet companies and websites have adopted the new architecture and development methodology in recent years.

This hands-on course introduces several software tools for working with Java applications, including project configuration, dependency management using Maven, source control using Git, and the Eclipse development environment. The course includes an overview of Spring, including core concepts such as Inversion of Control (IoC) and dependency injection.

You will build a sample Java application that creates RESTful Web services. The project uses Spring Boot and the MySQL database server as the datastore. You will also learn how to create microservices applications using Spring Boot and to work with databases using Hibernate. Emphasis is placed on testing all parts of your code with test automation (using JUnit and its Spring integration).

The course offers hands-on experience with open-source and demo tools, servers and databases.

Students are required to bring laptops to class.

Course Objectives:

At the conclusion of the course, participants should be able to:

- Build basic REST APIs using Spring Boot and interact with databases
- Have a working knowledge of Microservices deployment architecture
- Have a working knowledge of Git, Maven and an IDE
- Have working knowledge of testing using JUnit

Course Outline:

Week	Topics	Assignment Due
1	Class Overview, Introductions, Service Oriented Architecture, Git, Assignment 1	-
2	Agile and Microservices Mindset, Deployment components, Deployment architectures and Microservices, Understanding Dependency Injection/Inversion of Control, Maven	-
3	Introduction to Spring Framework, Spring configuration options and JUnit Testing, Assignment 2	Assignment 1 (Technical design doc)

4	HTTP, Introduction to REST, Designing REST+JSON APIs and best-practices	-
5	Spring Boot, Spring MVC and creating REST APIs	-
6	Relational Databases, JPA, Hibernate and MySQL, Spring integration, Assignment 3	Assignment 2 (Individual services)
7	REST APIs and test automation, Microservices infrastructure using Spring Cloud projects (Discovery, Configuration)	-
8	Catchup on missed items and any new topics requested, Fundamental Java - JSP, Filters and Servlets	-
9	Advanced topics – OAuth, CAP, Caching, Containers, and other deployment considerations	Assignment 3 (Data storage and putting it all together)
10	Final class presentations and discussions	Final class presentation

Important Notes:

- We will be using some very complex software frameworks and projects. You will run into issues and while I have extensive experience, unfortunately I will not always have all the answers!
- Please use the discussion forums to ask questions and try to answer questions as well
- I will monitor the forum as well and try to catchup at least once per week and help where possible
- You should also search for your issues on Google and Stack Overflow is another excellent resource

Performance Evaluation:

Project with each assignment as a milestone accounts for 100% of the grade.

	<u>Points</u>	<u>Grading</u>
Project		
- Assignments (x3) – 80% Assignments are 40 points each	120	Each assignment will define what is required and how it is graded
- Final Presentation – 20%	30	You will be given a grading rubric that defines how the presentation and your final source code will be reviewed

*Additional grading details are discussed in the Week 1 class

Note: Late assignments are not accepted.

Grade Change Option: Students who wish to utilize the Pass/No Pass option contact ExtensionGrade@ucsc.edu
(<mailto:ExtensionGrade@ucsc.edu>)

Default grading at UCSC-Silicon Valley Extension is for a Letter Grade (A-F). For more information, go to <http://www.ucsc-extension.edu/content/grading-and-credits> (<http://www.ucsc-extension.edu/content/grading-and-credits>)

Text:

No required textbook. All materials are online. Sample code is also provided online.

UCSC Extension Policies

Academic Integrity Policy

UCSC Extension, as a unit of the University of California Santa Cruz, takes academic integrity very seriously. All forms of academic misconduct, including but not limited to, cheating, fabrication, plagiarism, or facilitating academic dishonesty are grounds for student discipline. Unless otherwise indicated by the course instructor, assignments must be individual efforts. It is not acceptable to copy (verbatim or even with minor changes) sections of a book, article or Internet resource, and submit them as one's own work. Regardless of the source, all references must be properly cited and include full bibliographic information. Direct quotes must be indicated as such. Any questions about acceptable collaboration or uses of resources should be directed to the course instructor.

Examination and Homework Return Policy

If you wish to have your homework, projects, and/or examinations returned to you, provide your instructor with a self-addressed stamped envelope or submit one with your project or exam. Note: Not all examinations are eligible for return.

Grading Policies

Grading Options

Default grading at UCSC-Silicon Valley Extension is for a Letter Grade (A-F). For more information, go to <http://www.ucsc-extension.edu/content/grading-and-credits> (<http://www.ucsc-extension.edu/content/grading-and-credits>)

Dropping a Course

If a student does not intend to, or for any reason cannot, complete a course s/he is enrolled in, it is the student's obligation to formally notify the instructor and UCSC Extension prior to the last day of class. All drop requests must be submitted using the online form at <http://www.ucsc-extension.edu/content/drop-request> (<http://www.ucsc-extension.edu/content/drop-request>). To be eligible for a refund, **drop requests must be submitted at least three business days before the course begins. If we do not receive the request in that time period, no refund will be granted.**

Failure to follow this policy and associated guidelines may result in the entry of a default grade of "F" on the student's permanent record.

Incompletes

Under certain circumstances, an "incomplete" ("I") may be authorized for students who are unable to complete a course within the prescribed time. Students must have completed a minimum of 70 percent of the course work and it must be of passing quality in order to qualify for an incomplete grade.

To be considered for an incomplete, the student must send a formal request by email to extensionprogram@ucsc.edu (<mailto:program@ucsc-extension.edu>) before the last class meeting. If approved, the instructor and program director will agree upon the terms of the incomplete, including the specific work required and the deadline for clearing the incomplete. Once the necessary work has been submitted, the "I" will be changed to the appropriate grade. Incomplete grades must be cleared by the agreed upon deadline or the "I" will convert to "F." Courses paid under a contract may be subject to additional restrictions.

Students with an incomplete will not receive additional instruction or access to the online course website. Students must make independent arrangements with the instructor to make up missed assignments or class time outside of the normal course schedule. Students are not permitted to audit future courses to make up the missed work. All recommended plans must accommodate for these restrictions and are subject to approval by the academic department and Academic Review Committee (ARC).





Grade Changes

Per policy, changes to a course grade can be made by the instructor only on the basis of clerical or procedural error and never on the basis of reexamination or completion of additional work. For more information, contact ExtensionProgram@ucsc.edu (<mailto:ExtensionProgram@ucsc.edu>).

Access for Students with Disabilities

In keeping with the provisions and guidelines of the Americans with Disabilities Act, UCSC Extension makes every effort to make reasonable accommodation for those students with disability-related needs. If you require accommodation, please contact our Student Services Office at least 2 weeks prior to the event or course. The phone number to call is (408) 861-3749. If you need to use the California Relay Service, that number is (800) 735-2922. For more information, visit: <http://www.ucsc-extension.edu/student-services/ada> (<http://www.ucsc-extension.edu/student-services/ada>)

Course Summary:

Date	Details	
Tue Jun 13, 2017	 Assignment 1 (https://classroom.ucsc-extension.edu/courses/814/assignments/3986)	due by 6:30pm
Tue Jul 11, 2017	 Assignment 2 (https://classroom.ucsc-extension.edu/courses/814/assignments/3987)	due by 6:30pm
Tue Aug 1, 2017	 Assignment 3 (https://classroom.ucsc-extension.edu/courses/814/assignments/3988)	due by 6:30pm
Tue Aug 8, 2017	 Final (https://classroom.ucsc-extension.edu/courses/814/assignments/3991)	due by 9pm