

CSCI-201: Principles of Software Development

Spring 2022

Prof. Victor Adamchik

Course Description:

This course provides an introduction to backend and frontend web development in Java. Creating web applications requires various approaches and involves the integration of numerous technologies. The topics covered include object-oriented paradigm for programming (in Java); writing sophisticated concurrent network applications; managing data from relational databases using SQL and JDBC; building modern web pages with HTML, CSS, servlets, JSP and JavaScript; using professional tools on team project.

Learning Objectives:

- The ability to use Java in writing programs
- The ability to produce a software design based on requirements
- Understanding of concurrency
- The ability to write multi-threaded programs
- Understanding networking (socket) programming
- Understanding databases (MySQL) and SQL
- The ability to use HTML and CSS in designing graphical user interfaces
- The ability to utilize servlets, JSP and JavaScript for building web pages
- The ability to work effectively on a team

Prerequisites:

CSCI 104L – Data Structures and Object-Oriented Design

Recommended Textbooks:

Liang, Y. Daniel. *Introduction to Java Programming and Data Structures*, Comprehensive Version, 12th Edition Prentice Hall, Inc., 2017, ISBN 978-0136520238

Computing Environment:

To be able to do program development in this class, it is necessary to install

1. JDK (Java Development Kit)
2. Eclipse (an integrated development environment)
3. Gson (JSON data-binding support for Java from Google)
4. Tomcat (a web server designed to host and run Java-based web applications)
5. MySQL (relational database management system)
6. Workbench (a visual tool for database architects)
7. JDBC (an API for accessing database)
8. Java.servlet (an API for the HTTP protocol)

Lectures:

All lectures are in-person; they also will be videotaped. The recordings and lecture slides will be available in DEN.

Programming Labs:

The CPs will lead the lab section each week. There will be an assigned lab program each week that reinforces the topics covered in the lectures. The labs are intended to be completed during the lab period, and you are expected to work *individually* on the lab during the section. The lab assistants are there to answer any questions and help you, so use your time in lab wisely. You will be asked one or more questions by the lab assistants at the end of each lab to ensure you understood what was covered. You may drop any one lab with the lowest grade. We will not video record labs, because during the lab no new material will be taught.

Final Project:

The project will be assigned approximately half-way through the semester. You are required to submit an initial proposal. Once we receive all proposals, CPs will create (pseudo randomly) project groups. As a group you will have weekly meetings with your CPs. The project will consist of between 6-7 students. Formal documentation following the software engineering process will be required. The project deliverables should be submitted to DEN by the due date. We will discuss this in more details when the time comes.

Programming Assignments:

Assignments will be discussed in class and worked on individually. Discussion among students is fine, but no copying of other student's code is allowed. The program needs to compile, and grading will only occur if the program is able to be run. Assignments shall be submitted to DEN and due by 11:59p.m. on the due date. Grading criteria will be provided with the assignment description. CPs will grade the assignments. Due to the manual grading, we require you to submit Eclipse project. All grades will be posted to DEN's gradebook.

There is no late policy. Any assignment is submitted after 11:59pm on the due date late will receive a 0. No late assignments will be accepted except for extenuating circumstances with supporting documentation and a letter of support from your academic adviser.

Quizzes:

There will be online quizzes in DEN. The quizzes are an individual effort. You may not use any means to communicate to other students on quizzes for any reason. The goal of quizzes is to ensure that students are attending/watching the lectures and understanding some of the concepts covered. All quizzes will be available starting on Thursday at 5pm with the deadline Friday at 11:59p.m. There are no makeup quizzes. The quiz length is set to 15 mins. Students can take the quiz (only once) at any time during this time frame. You may drop any one quiz with the lowest grade. Accommodations for students with letters from DSP/OSAS will be provided ("Students should make arrangements directly with their faculty member at least one week in advance of the quiz, test or exam date").

Exams:

There will be two midterm exams. The exams are closed book and will consist of theoretical questions. The exams are an individual effort. The exams can only be taken within the scheduled time period. Accommodations for students with letters from DSP and for international students taking the class online will be provided. There are no makeup exams. If you miss an exam due to an emergency, official written documentation, whatever that may be based on the situation, will need to be submitted to me as soon as you are physically able (before the exam if possible).

Piazza & Emails: (piazza.com/usc/spring2022/csci201)

If you have a question about the material or logistics of the class, please post it on the piazza page (do not use e-mail). You may post it publicly to the whole class or privately to the instructors. Often times, if one student has a question/comment, other also have a similar question/comment. Please DO NOT send emails to the course staff unless your issue is private and/or a private post on Piazza is unsuitable.

Grading:

Labs	10%
Assignments	15%
Quizzes	10%
Midterm exam-1	20%
Midterm exam-2	20%
Group Project	25%

Letter Grade Distribution:

≥ 93	A	73 – 77	C
90 – 93	A-	70 – 73	C-
87 – 90	B+	67 – 70	D+
83 – 87	B	63 – 67	D
80 – 83	B-	60 – 63	D-
77 – 80	C+	<60	F

Schedule:

This schedule is meant as an outline. Depending on progress, material may be added or removed.

Week	Date	Topics Covered	PA	Labs/Quizzes
1	Jan. 11	Lecture 1: Introduction		
	Jan. 13	Lecture 2: OO design.		
2	Jan. 18	Lecture 3: Garbage Collector. Intro to Generics	PA-1	1: Inheritance
	Jan. 20	Lecture 4: Arrays. Cloning. Iterator. Comparator		Quiz 1
3	Jan. 25	Lecture 5: I/O. Exceptions. Serialization		2: Arrays
	Jan. 27	Lecture 6: Collections Framework		Quiz 2
4	Feb. 1	Lecture 7: HTML. CSS		3: Collections
	Feb. 3	Lecture 8: Java Servlets		Quiz 3
5	Feb. 8	Lecture 9: JSP	PA-2	4: Servlets
	Feb. 10	Lecture 10: JavaScript. DOM		Quiz 4
6	Feb. 15	Lecture 11: JS. JSTL. XML		5: MySQL installation
	Feb. 17	Project Discussion		Quiz 5
7	Feb. 22	Lecture 12: Databases. MySQL		6: SQL
	Feb. 24	Lecture 13: SQL		Quiz 6
8	Mar. 1	Lecture 14: SQL Network Programming		7: JDBC
	Mar. 3	Lecture 15: JDBC Server/Client model		Quiz 7
9	Mar. 8	Lecture 16: Mongo Database		
	Mar. 10	Midterm Exam		
10	Mar. 15	Spring Recess		
	Mar. 17	Spring Recess		
11	Mar. 22	Lecture 17: Concurrent Computing	PA-3	
	Mar. 24	Lecture 18: Pools. Synchronization		

12	Mar. 29	Lecture 19: Monitors. Locks. Conditions		8: Threads
	Mar. 31	Lecture 20: Semaphores. Concurrent Collections		Quiz 8
13	Apr. 5	Lecture 21: Parallel Computing		9: Doordash Driver
	Apr. 7	Lecture 22: Parallel Streams		Quiz 9
14	Apr. 12	Lecture 23: Network Programming		10: Parallel Computing
	Apr. 14	Lecture 24: Network Programming		Quiz 10
15	Apr. 19	Lecture 25: Multi-Threaded Network		11: Network Programming
	Apr. 21	Lecture 26: Multi-Threaded Network		Quiz 11
16	Apr. 26	Review for exam		
	Apr. 28	Midterm Exam		

Programming Assignments (tentative dates):

Assignment	Content	Out	Due
PA1	JSON, Collections	Jan. 13	Feb. 8
PA2	Java Servlets, Databases	Feb. 8	Mar. 8
PA3	JSON, Multi-Threaded Programming	Mar. 22	Apr. 19

Academic Integrity:

The USC Student Conduct Code prohibits plagiarism. All USC students are responsible for reading and following the Student Conduct Code, which appears on <https://policy.usc.edu/files/2018/07/SCampus-2018-19.pdf>.

The Viterbi School of Engineering's policy on Academic Integrity can be found at <http://viterbi.usc.edu/academics/integrity/>. All students are expected to understand and abide by these principles.

In this course we encourage students to study together. This includes discussing general strategies to be used on individual assignments. However, all work submitted for the class is to be done individually. Some

examples of what is not allowed by the conduct code: copying all or part of someone else's work (by hand or by looking at others' files, either secretly or if shown), and submitting it as your own; giving another student in the class a copy of your assignment solution; consulting with another student during an exam. If you have questions about what is allowed, please discuss it with the course staff.