SYLLABUS
CSCI 3308: SOFTWARE DEVELOPMENT METHODS AND TOOLS

Course Information

Semester: Summer 2019
Credit: 3 credits
Dates: Term C: Monday, June 3, 2019 - Friday, July 26, 2019
Class Meetings: Lecture — Monday, Wednesday, Friday 2:30 – 3:40 PM, ECES 114
Lab — Tuesday, Thursday 2:30 – 4:05 PM, ECES 114

Instructor
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Course description

This course covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming, and test-driven design. Students will complete a course project to apply the tools and practice they have learned.

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Textbook and materials: There is no required text for this course.
All the reading materials will be provided by the instructor each week via Canvas. Readings will include the following topics:

Unix, Regex, Bash Shell Scripting, Software Process & Methodologies, Scrum, Version Control, Planning Poker, RDBMS, E-R Diagrams, Intro to SQL, NoSQL, XML, JSON, SOAP vs REST, Retrospectives, Cloud Computing & Heroku, Testing

Bringing your own laptop to lectures and labs is highly recommended.

Slack channel: We will be using Slack for class discussion. Slack is a popular communication platform for teamwork and is widely used in the industry. If you haven't used Slack before, you can check out what Slack can do here. The slack channel is **csci3308group.slack.com**

Course Outcomes

- Students will learn the fundamentals of software development methods and gain exposure and practice using common industry tools that are likely to be used in the workplace.
- Students will successfully use a variety of software development skills and tools introduced in class.
- Students will be equipped to choose the best software tool for use in a specific situation.
- Students will apply software knowledge and skills in the context of a small group semester-long project (5 weeks).

Brief, high-level list of topics to be covered (subjects may change as the semester proceeds):

- Unix Shell Scripting
- Waterfall, Agile development methodologies
- Principles of Project Management
- Requirements Definition and Analysis
- Relational Database Design & Construction
- Pair Programming
- HTML & CSS ("Front-end")
- PHP/NodeJS
- SQL
- Documentation of Code
- Web Services
- Cloud Computing
- Licensing/Copyright/Patents/IP
- Code Quality Assessment
- Testing Methods and Strategies
- Static and Dynamic Analysis
- Refactoring
- Code/Peer Review
- Source Code Version Control and Managing Code Conflicts

Grading

Component	%
Labs (10 assignments; points vary)	10
Assignments (3 assignments; points vary)	30
Quizzes (4 quizzes; points vary)	20
Project	40

Grades are based on the final percentages:

93-100 A 90-92 A- 87-89 B+ 83-86 B

73-76 C 80-82 B- 77-79 C+ 70-72 C-

60-69 D 0-59 F

Homework Assignments
The course includes THREE assignments that makeup 30% of the final grade. Each assignment must be completed and submitted via Canvas by its due date to earn full credit.

1. Bash Shell Scripts (50 points)

2. SQL (60 points)

3. REST API (80 points)

Group Project
Students are required to form a team consisting of at least 4 students and no more than 6 students. Each team will execute a software development project. The team will agree upon a software product that they will design, develop, test, and present to the class. This project makes up 30% of the final grade.

This project will challenge students to use the software tools and methods covered in lectures and labs. Project grades are based on the submission of the following milestones submitted throughout the semester:

Milestone 1	30 points	Team formation and project proposal
Milestone 2	35 points	Project management, requirements, methodology
Milestone 3	50 points	Database Design
Milestone 4	20 points	Mid-semester check-in
Milestone 5	40 points	Testing and documentation
Milestone 6	30 points	Project presentations
Milestone 7	50 points	Final project report and peer evaluation

Teams will be using a shared GitHub repository for submitting project code. The instructor and grade will be reviewing all of your team's GitHub commits to determine your final grade.

All students MUST participate in the group project to pass this course. A student's group project grade will be adjusted based on a team evaluation that will be turned in by each student at the end of the semester.

Your Project Grade = (sum of project milestone grades) adjusted by your peers' evaluation of your contributions and participation as a member of the team.

Peer evaluation is based on your team members' ratings of your contributions. This includes your time, your work, your attitude, your communication, your accessibility, your persistence.

Quizzes

There will be 4 quizzes throughout the semester. Together the quizzes make up 20% of your final grade. The quizzes will be completed in lab.

Submission policy

There are no late assignments in this course. You can verify that your submission is uploaded correctly in the online submission system – it is your responsibility to ensure that you submitted the correct files and submitted them correctly during the time allocated. After you submit online, go back to the assignment submission page, ensure it shows that you have submitted, then download your submission and make sure it contains the correct files and everything is right.

You should be backing up your assignment and lab files on Google Drive or Dropbox, so if you cannot reboot your computer you may borrow one or use the ones in the computer lab to access your files in your Google Drive/Dropbox account.

In the case of documented personal, family, or medical emergency please let the instructor know as soon as possible.

Attendance

In general, attendance at all lectures is not graded per se, but is highly recommended. You are responsible for knowing the material presented during lectures and labs, even if you are not in attendance when the material was presented. Attendance at lab is required. Your attendance at each lab will be recorded by the Instructor. Participation in a lab by PROXY is NOT ALLOWED. Each lab will require work for each student to complete. You can leave lab once your work is done and approved by the Instructor.

Accommodations

The university is committed to providing to all students the support and services needed to participate in this course. If a student qualifies for accommodations because of a disability, the student should submit to the instructor a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu. If you have a temporary medical condition or injury, see Temporary Medical Conditions: Injuries, Surgeries, and Illnesses guidelines under Quick Links at Disability Services website and discuss your needs with the instructor.

Religious Observances

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required assignments/attendance. For students in situations where this applies, such issues must be communicated to the instructor as early as possible.

Classroom Behavior

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, ability, and nationality. Class rosters are provided to the instructor with the student's legal name. The instructor will honor student requests to be addressed by an alternate name or gender pronoun. Students must advise the instructor of this preference early in the semester so that appropriate roster annotations may be made. For more information, see the policies on class behavior and the student code.

Discrimination and Harassment

The University of Colorado Boulder (CU-Boulder) is committed to maintaining a positive learning, working, and living environment. CU-Boulder will not tolerate acts of discrimination or harassment based upon Protected Classes or related retaliation against or by any employee or student. For purposes of this CU-Boulder policy, "Protected Classes" refers to race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been discriminated against should contact the Office of Discrimination

and Harassment (ODH) at 303-492-2127 or the Office of Student Conduct (OSC) at 303-492-5550. The full policy on discrimination and harassment has more information.

Honor code

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). The Honor Code Office has more information..

Collaboration on homework assignments is allowed and encouraged unless mentioned otherwise. Students are most successful when they are working with other students to understand new concepts. The ultimate goal is that you fully understand the code you develop. You must acknowledge who you worked with.

Plagiarism includes using material from outside sources (e.g., the web) without clear identification and citation. Unless otherwise specified, you may make use of outside resources (internet, other books, people), but then you must give credit by citing your sources in the comments inside your code.

Examples (assuming // indicates beginning of code comment):

// Modified version from https://github.com/Phhere/MOSS-PHP

// Adapted from Program #7.2 in book "Accelerated C++" by Stroustrup

// Worked with Joe Smith from class to come up with algorithm for sorting

// Received suggestions from StackExchange website (see http://....)

A good rule of thumb: "If the words or code did not come from your brain, then you need to attribute where you got it."

Syllabus changes

The instructor reserves the right to modify this syllabus as needed during the semester. Should any changes be necessary, the instructor will inform students of the change and post and updated copy of the syllabus to Moodle.