CS 4500: Senior Capstone Project
Course Details and Objectives
Spring 2020

Description of CS4500
The purpose of the Capstone Project is for seniors to bring all of their knowledge and abilities to bear to work in a team environment to create an excellent, professional, and polished, software-product. This project should form the cornerstone of your portfolio when applying for a job. This course focuses on the development stages necessary for producing the final software project. Unlike a standard lecture course, most weeks will see the team working as a unit without lectures. Teams will often meet with the course staff to discuss their status and review upcoming milestones. Several presentations and demonstrations will be required during the semester to keep the course staff and students apprised of project status. You should plan to spend a commensurate amount of time on this class as your other CS electives. Please note, that at the end of this process, we want you to have produced a software project that will resonate with and impress members of industry and academics. Something that industry would be willing to sell or use internally. Something that will impress your favorite professor. Something that demonstrates your talents and ingenuity. When we push you, we are pushing you to realize this goal.

Requirements
It is required that students enrolled in CS 4500 were also enrolled in CS 4000 during the previous semester. Students in the class will continue with the teams and projects created during the Senior Capstone Design course.

Meetings
Each team will regularly meet with the course staff. During these meetings, we will assess the team’s progress to help make sure everyone is on track for their project to succeed, offer advice for any problems or issues that arise, and give guidance on how to proceed at each stage of the development process. These meetings are required.

There will be very few lectures in this class. We will occasionally use the designated class room and time for class-wide presentations.

Instructors
- Daniel Kopta: Email: dkopta@cs.utah.edu Office: MEB 3124
- Joe Zachary: Email: zachary@cs.utah.edu Office: MEB 3190A

TAs
- Ambuj Arora
- Neha Kherde
Learning Outcomes

Upon completion of CS 4500, students will be able to:

1. conduct oral presentations describing projects in various states of completion; create a video presentation demonstrating and promoting the product
2. work with multiple teammates to accomplish large scale goals; integrate code with that of other developers, test and evaluate project software
3. advance an existing software prototype through multiple releases (Alpha, Beta, Final) and formally demonstrate the completed product
4. conduct user studies and apply feedback to improve a product
5. use modern SE design tools, methodologies, and processes, e.g., Agile, sprints, and task-management
6. evaluate and provide constructive feedback to peers on their software, presentations, and documentation

Class website

The class web site uses Canvas: [utah.instructure.com](http://utah.instructure.com). It will contain all pertinent course info and materials. It will also contain all assignments, and will be where you hand in most of your work. All of your grades will be posted on this site so you can keep up with them throughout the semester. We will send email to everyone in the class, such as corrections to assignments, changes to due dates, clarifications, etc. through Canvas. Students are required to check their email and the class web page regularly.

Office hours

One of the goals of this class is for your team to function as independently as possible, but the course staff are here to help you. We are available outside of scheduled class time/office hours by appointment.

Homework

Homework in CS 4500 will consist mostly of development on your project. This will be divided in to three major releases:

- **Alpha (weeks 1-4)** - A project with all core parts integrated and functioning, but missing some polish, testing, and advanced features.
- **Beta (weeks 5-8)** - A mostly working software system. Advanced features exist and are usable. Polish and smooth integration may still be missing.
- **Release (starting week 9)** - The final polished project with no major bugs.

These releases will be accompanied by in-class presentations, videos, and/or team-professor demonstrations, as well as documentation.

Each student will also submit a weekly progress report, similar to CS 4000. See the class web site for details.
Grading

The Capstone Design class grades will follow the official University of Utah guidelines:

- A : Excellent performance, superior achievement
- B : Good performance, substantial achievement
- C : Standard performance and achievement
- D : Substandard performance, marginal achievement
- E : Unsatisfactory performance and achievement

Letter grades will be assigned using the below scale, where \( X \) is your total score. Scores will not be rounded.

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\begin{align*}
90 > X & \geq 87 \quad B+ \\
87 > X & \geq 83 \quad B \\
80 > X & \geq 77 \quad C+ \\
77 > X & \geq 73 \quad C \\
70 > X & \geq 67 \quad D+ \\
67 > X & \geq 63 \quad D \\
60 > X & \geq 0 \quad E \\
93 > X & \geq 90 \quad A- \\
90 > X & \geq 87 \quad A \\
87 > X & \geq 83 \quad B \\
83 > X & \geq 77 \quad C+ \\
77 > X & \geq 73 \quad C \\
70 > X & \geq 67 \quad D \\
67 > X & \geq 63 \quad D+ \\
63 > X & \geq 0 \quad E
\end{align*}
\]

Final scores will be determined by performance in the following categories.

- 10% Meetings, participation, and progress reports
- 20% Presentations
- 10% Alpha Release
- 10% Beta Release
- 10% Final Release, with input from judging on demo day
- 20% Holistic team contribution factor, overall modifier
- 10% User studies
- 5% Final user/technical documentation
- 5% Final project reports

Overall Grade

Please note that the above percentages may not determine the final course grade. During the final letter grade computation, the course staff will evaluate each team member based on the overall quality of the team project, the quality of their contribution, and their contribution as evaluated by their team peers. This will include the team member’s contribution across the entire semester. As such, the instructor reserves the right to make adjustments to final course letter grades, as appropriate. Again, this will be determined by the overall quality of the deliverable, as well as displayed leadership, software development ability, team work, and other intangible contributions. Individuals on teams that see all members contribute equally and which produce high quality work
can expect high overall grades in the Holistic Team Contribution category. Individuals on teams where the final project is not superior and/or where certain team members produce less than others, can expect to see substantial deduction to the Holistic Team Contribution Factor. For example, a student who produces far less than their peers, but whose team earns an A overall, may earn a B (or even C) in the course.

**Peer Grading**

Some grading will be done by your peers using an aggregation system. Peer grading will often occur with evaluation of public oral and written communications. Also, each week you will be asked to evaluate the performance of your teammates. Completing these evaluations will award credit. These grades will affect your final course letter grade. Further, how well your project is received by the academic and industry judges on Demo Day will also be considered in your overall grade.

**Attendance**

By enrolling in this course you are implying your availability to complete and attend all lectures, assignments, and meetings. There will be no extensions on assignments due to absence, unless there is a legitimate emergency. Specifically, vacation time and job responsibilities are not a legitimate emergency.

**College of Engineering Guidelines**

https://www.coe.utah.edu/semester-guidelines

**School of Computing Guidelines**

https://www.cs.utah.edu/socguidelines/

**Safety**

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Violence and harassment based on race, national origin, color, religion, age, disability, sex or gender (which includes sexual orientation and gender identity/expression) is a civil rights offense and will not be tolerated. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776.
Students with Disabilities

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.