Syllabus

Course title and number	CSCE 482:931: SENIOR CAPSTONE DESIGN
Term (e.g., Fall 200X)	Spring 2020
Meeting times and location	Section: 931
	M/W 11:15am-11:40am, EABA 118 (Lecture)
	M/W 11:45am-2:15pm, EABA 118 (Lab)

Course Description and Prerequisites

This is a project-based course focusing on skills for system integration in order to solve real-world problems in computer science. It involves a significant team software project that integrates advanced concepts across computer science specializations, requiring the whole process from design, implementation, documentation and demonstration, as well as establishing a design methodology, management process and team management. Emphasis is placed upon student's activities as design professionals.

Instructor Information

Name	Dr. Dylan Shell
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Office hours	Tuesday 11:00am-12:00pm, + by appointment.
Office location	HRBB 330C

TA Information

Name	Jerry Yiu
Email address	yfyiu@tamu.edu
Hours	Available during Lab times and via appointment.
Office hours meeting location	EABA 118

Detailed Description

CSCE 482 is a project-oriented course aimed at developing system integration skills. Students work in groups of 3-4 people to complete a significant software engineering design project. Every project requires complete implementation, documentation and demonstration of a software system, which may also involve minor hardware too. The focus is not only on the final product but also on design methodology, management process and teamwork

Each team will be required to manage its own efforts to complete its project in a timely manner. Group members will be required to keep individual lab notebooks recording their efforts and their personal impressions of the project. Students will be graded based on both the quality of the group product and their individual contributions.

Every team will be required to schedule a weekly meeting with the course instructor and the TA, preferably during the official class or lab hours. These meetings must be attended by every group member. Since the projects will be student managed, the exact nature and style of these meetings is at the group's discretion. **However, every member of the group is expected to participate.**

At the end of the semester, each group will make a public presentation describing and demonstrating their work. These presentations will be open to the university community and visitors from industry.

Course Objectives

To prepare students for engineering practice with a major design experience based on the knowledge and skills acquired in earlier course work and incorporating standards and realistic constraints that include most of the following considerations: economic; environmental; sustainability; manufacturability; ethical; health and safety; social; and political.

Learning Outcomes

It is expected that successful participation in the course will allow the student to demonstrate:

- an ability to apply knowledge of mathematics, science, and engineering (3.a)

- an ability to design and conduct experiments, as well as to analyze and interpret data (3.b)
- an ability to design a system, component, or process to meet desired needs (3.c)
- an ability to function on multi-disciplinary teams (3.d)
- an ability to identify, formulate, and solve engineering problems (3.e)
- an understanding of professional and ethical responsibility (3.f)
- an ability to communicate effectively (3.g)
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (3.k)

Textbook and/or Resource Material

Required:

Patric M. Lencioni, 2002, “The Five Dysfunctions of a Team: a Leadership Fable” Jossey-Bass.
(Electronic copy available to all via the library.)

Recommended:

Ralph Ford and Chris Coulston, 2007, "Design for Electrical and Computer Engineers,” McGraw-Hill Education.

Barry Hyman, 2003, "Fundamentals of Engineering Design," second edition, Prentice Hall.

Roger Pressman, 2009, “Software Engineering: A Practitioner's Approach,” seventh edition, McGraw-Hill.

James Shore, 2007, “The Art of Agile Development,” O'Reilly
(Electronic copy available to all via the library.)

Grading Policies

The final grade you will receive in the class will be based on points accumulated during the semester. Thus, both continued progress (the process) and the quality of your product (and other deliverables) will determine your grade. Although the majority of your grade (65%) is

based on the performance of your team, individual performance will also be evaluated.

1. **Project Proposal (15%)**
   These points will be based on the originality, quality and feasibility of the proposed work, the analysis of alternative solutions, the consideration of economic and societal aspects, and the project management approach, as reflected on your written proposal (75%) and oral presentation (25%). A template for the proposal report and a presentation rubric are available on the course webpage.

2. **Weekly Progress (10%)**
   This grade will be based on your team's ability to keep the project on schedule. The weekly report should be incremental, and should specifically address the following:

   1. An **agenda for the meeting** with the instructor/TA
   2. Any **major accomplishments** during this time period, including figures and results
   3. The **team's goals** for the following week
   4. An update on project management, including teamwork, purchases, schedule and milestone status
   5. **Minutes** of the previous meeting

   Weekly progress reports are due 8 a.m. the day of the weekly meeting. The responsibility of preparing these reports will be rotated among team members. The team member preparing the report will also be in charge of facilitating the discussions during that weekly meeting, and preparing an action list for the following week.

3. **Critical Design Review (10%)**
   The CDR is a mid-semester evaluation of your project. The grade will be based on your progress to date, and the quality of your oral presentation and accompanying report. A template for the CDR report and presentation rubric will be available on the website.

4. **Final Communication (10%)**
   This grade will be based on the quality of the final presentation (25%), as well as the contents and professional finish of the documentation (75%). Final reports should have a discussion of constraints that the team had to satisfy (e.g., cost, time, technology limitations) and of relevant industry standards used (e.g., coding, interfaces, safety).

5. **Project Grade (20%)**
   A final grade will be assigned to your project based on the completion of all the objectives stated in the proposal, as well as on a live demonstration. The complexity of your project and the size of your team will be factored in.

Due date: Project demonstrations will take place the last day of class of the week prior to final presentations. This earlier deadline ensures that teams have time to (i) thoroughly test and validate their systems after the demo, and (ii) prepare the final presentation.

6. **Team work (5%)**

It is very important to understand that accomplishing the technical objectives of the project is not sufficient. These accomplishments should not come at the expense of destroying relationships among team members. Thus, a grade will be assigned based on the ability of the group to function as a team. Is there evidence that the group engaged in team building activities? Were contributions to the project evenly distributed? Were members equally engaged in discussions during meetings? Was there an effective division of responsibilities.

Location: Unlike some other capstone offerings, we do not insist on work being done in the lab; what matters is that the team worked cohesively.

7. **Individual Performance (30%)**

Points in this category are based on assessment of your personal contribution to the project and team-effort:

a) Personal Design Contributions (aka lab notebook) (10%)

You are required record what YOU do as a member of the project. This can be done either in physical or virtual form. Examples of the former would be a notebook or spiral-bound file, whereas virtual documentation might be in the form of a blog or web-page, or even software version control comments and notes in the form of a log. *Entries should be made during or shortly after every work session.* Each entry should include at the very last (1) the date, (2) the objectives for that session, and (3) record of what was done.

A grade will be assigned to your personal designs and logs of your design effort based on:

i. The regularity of your entries throughout the semester.
ii. The evidence of an engineering design process, including but not limited to schematics, block diagrams, ER diagrams, flow-charts, pseudo-code, tables of experimental results, and mathematical derivations.
iii. The clarity, legibility and organization of your annotations.

b) Participation (10%)

The instructor and TAs will evaluate your attendance to meetings, participation in the discussions, and contributions to the team. Team leaders will instead be evaluated by their ability to make the group operate as a team, i.e., item (6) above.

c) Peer Review (10%)

Your performance will be evaluated by each of your team members throughout the semester. (Dates appear in the table below.)

Note: Grades will not be assigned until all project deliverables have been turned in (see below), all borrowed items (e.g., keys, books, equipment) have been returned to their proper location or their owner, and the workstations in HRRB 203 have been thoroughly cleaned up. All team members are required to be present at the time of the final delivery.

Final Deliverables

1. A bound hardcopy of the final documentation
2. A USB key including the following (please organize into folders, e.g., Docs, Source, Hardware (if applicable), Media, References, Freeware)
   a) Designs: code, documentation (APIs, internal support document, user-guide, help files), data, freeware software tools, etc.
   b) Reports: proposal, CDR, weekly reports, final report, and ALL presentations
   c) Audiovisual media: close-up pictures of your system *AND* a high-quality video demonstration of the system working, for posterity.
3. Final hardware/software prototype, as well as any spare parts and supplies if appropriate.
4. Software install, if appropriate, to be demonstrated on multiple machines.
5. The final peer reviews
6. Evidence of individual design contributions

Document Preparation

All major documents (technical survey, proposal, CDR, and final documentation) should be submitted in a professional form. This includes being bound, containing a title page, an outline, as well as clear section and subsection headings, etc. Students are strongly encouraged to submit documents typeset in LaTeX. Proofread and run a spell check before submission!

Attendance Policy

Not attending weekly meetings harms the other members of your group and makes it much more difficult for the instructor to assess your contributions to the group effort. Therefore, attendance, punctuality and active participation in the weekly meetings are strict requirements. Failure to attend a meeting or late arrivals (more than

15 minutes late) will be reflected in your individual grade. Emergencies, however, do happen. Lateness or absence can be excused if there is a valid reason. Illness, job interviews out of town, death in the family, inclement weather or accidents for commuters, etc., are valid reasons. Oversleeping, a term paper due, an exam to cram for, etc., are not valid reasons. Ultimately, the instructor reserves the right to determine what constitutes a “valid reason” on a case by case basis. If you know you’re going to be late or miss a class, please let the instructor and your teammates know, so that they may plan for your absence and make the best use of their time.

Course Schedule and Major Milestones

Syllabus topics and readings are subject to change, exact dates depend on class progress

Date	**Topic**	**Material Due**
13 Jan.	Course Introduction	
15 Jan.	Kick-off Lectures	Résumés
22 Jan.	Teams are formed	Teams are formed
10 Feb.	Proposal Presentations	
12 Feb.	Proposal Presentations	
17 Feb.		Proposal Documents + Peer Review
9 Mar.	*Spring break*	
23 Mar.	CDR Presentations	
23 Mar.	CDR Presentations	
28 Mar		Critical Design Review + Peer Review
20 Apr.	Project Demos	Project Demo
29 Apr (?).	Final Presentation	Final Presentation
29 Apr.	Check out (before 5pm)	Final Report, all deliverables

Academic Integrity

Please review Section 20 of the TAMU Student Rules (http://student-rules.tamu.edu/) for a list of examples of scholastic dishonesty. In particular, be aware of the issues of plagiarism and fabrication of information. The use of existing software implementations or hardware designs should be discussed with the instructor prior to being incorporated into the project. Proper credit must be given to the original source of concepts, designs, software, technical documents, scientific literature, etc.

For additional information please visit: http://www.tamu.edu/aggiehonor

"An Aggie does not lie, cheat, or steal, or tolerate those who do."

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu