

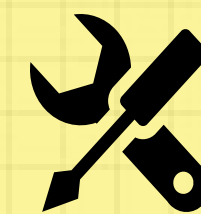
SPRING 2020

Computer System Design



EABA 121B

TR 8:00 AM - 8:25 AM



EABA 121B

TR 8:30 AM - 11:00 AM



Jyotikrishna Dass
Graduate Teaching Fellow

Course Description

Project-based course focussing on skills for system integration in order to solve real-world problems in computer science and engineering. It involves a significant **Engineering Design Project** to be accomplished in a **group of 3-4 students**. Every project requires complete implementation, documentation, and demonstration of a **computing system with both hardware and software designs**. The focus is not only on the final product but also on the design methodology, management process, and teamwork.

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SYLLABUS

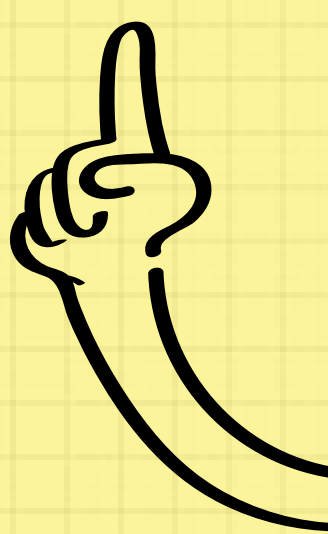
Each team will be required to manage its own efforts to complete its project in a timely manner. Group members will be required to keep individual lab notebooks recording their efforts and their personal impressions of the project. Students will be graded based on both the quality of the group product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

Every team will be required to schedule a weekly meeting with the course instructor and the TA 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.

Prerequisites ?

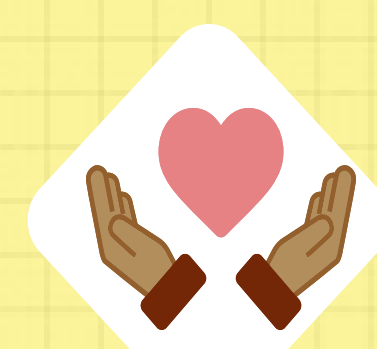
CSCE 315,
CSCE 462,
ECEN 325



Creativity



Enthusiasm



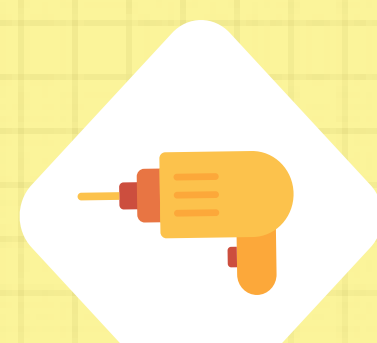
Care & Empathy



Team Work



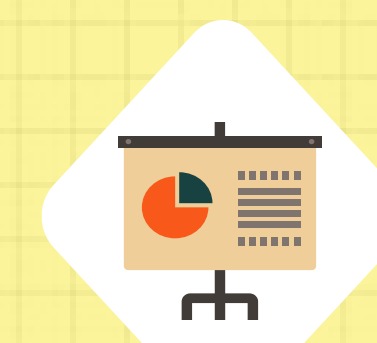
Time Management



Perseverance



Documentation



Presentation



Learning Outcomes

This course prepares students for engineering practice with major design experience. The students will leverage the knowledge and skills acquired in earlier course work. 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 with equal contribution, maintain an inclusive environment, and manage time efficiently (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)

You will also

- understand and utilize the engineering design method to generate potential solutions to a specific design challenge,
- understand the basics of project management including statements of work, work break-down structures, critical path identification, distribution of tasks, project tracking and status reporting as well as be able to generate status reports,
- understand professional communication methods and techniques including formal reports and presentations,
- clearly communicate ideas, status and test results through written reports,
- clearly communicate through oral presentations,
- rigorously define design requirements for potential solutions, and
- understand and incorporate engineering standards and multiple realistic constraints that include most of the following considerations: economic, environmental, sustainability, manufacturability, ethical, health and safety, social and political.

GRADING POLICIES



Grades are determined from both team (65%) and individual (35%) components accumulated during the semester



Both continued progress and the quality of your product (and other deliverables) will determine your grade



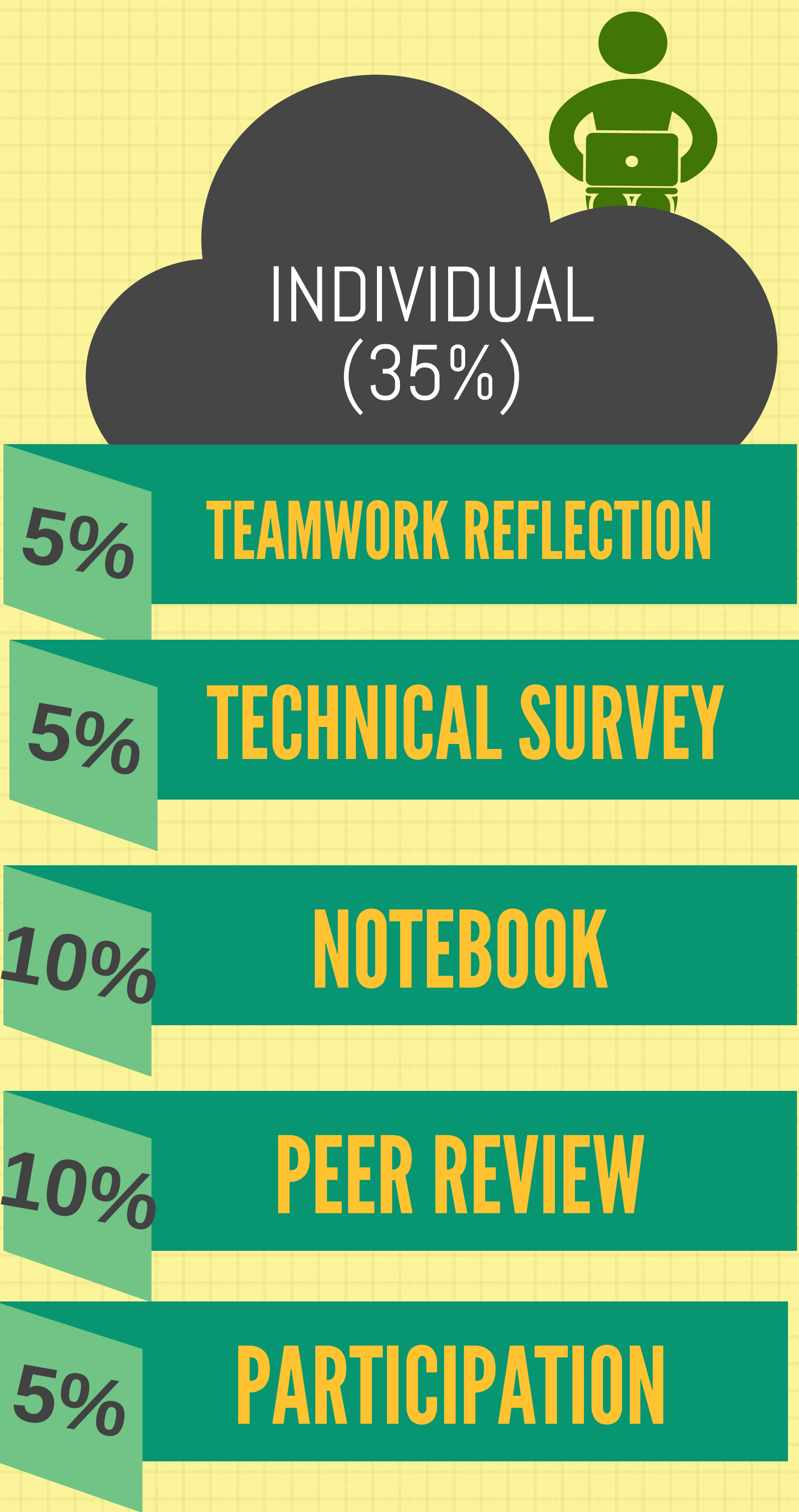
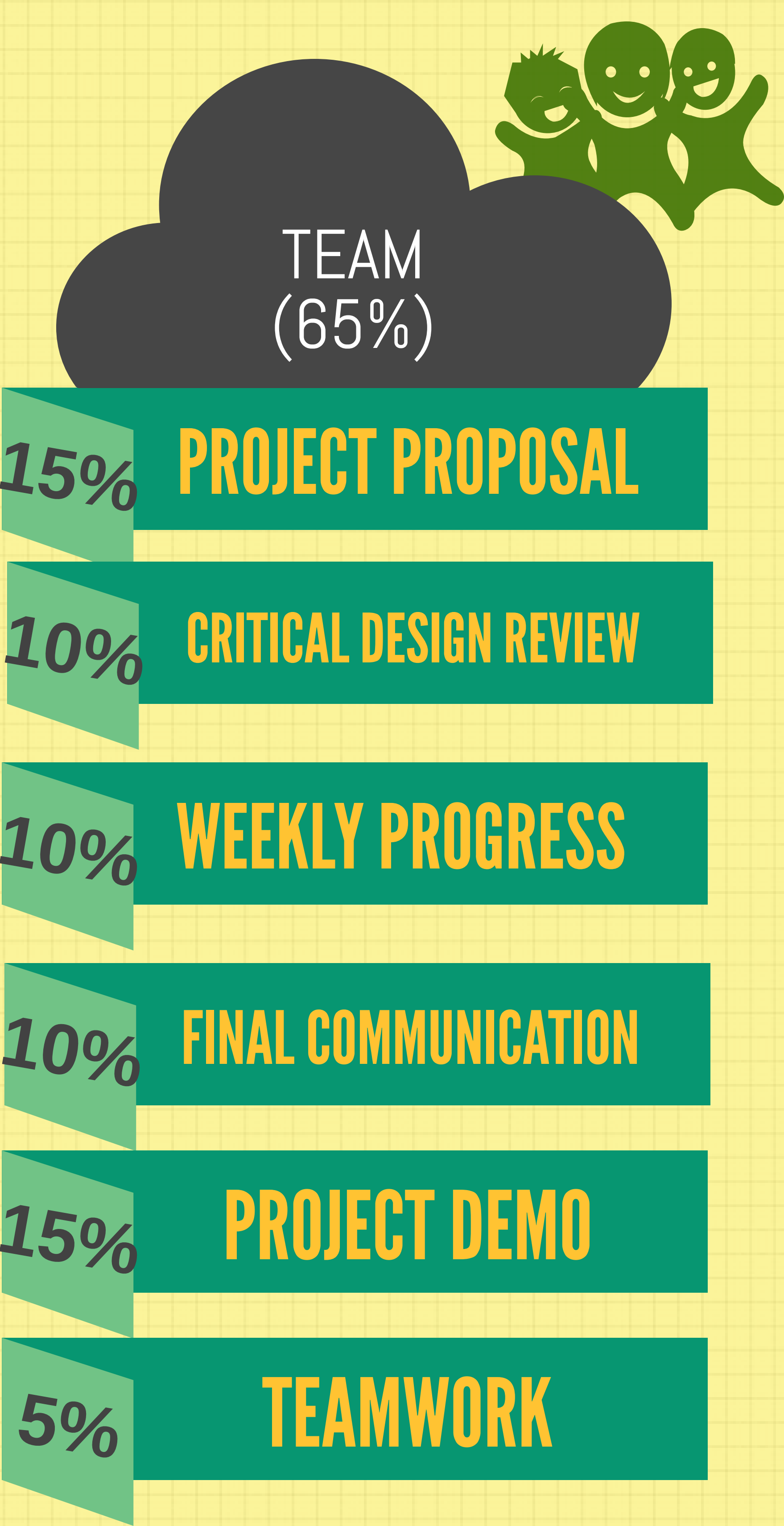
Final course grades will not be released until all the project deliverables are turned in, all borrowed items (e.g., keys, books, equipment) have been returned to their proper location or owner, and the workstations in the lab have been thoroughly cleaned up.



All team members are required to be present at the time of the final delivery. Final project deliverables include

- a bound hardcopy of the final project report
- a USB Flash Drive including the following (organize into folders, e.g., Docs, Source, Hardware, Media, References, Freeware, etc.)
 - *Designs:* code , readme file, schematics , data , datasheets , freeware software tools, etc.
 - *Reports:* proposal, CDR , weekly reports , final report , and ALL presentations
 - *Audiovisual media:* close-up pictures of your system and a high-quality movie demo of the system working
- a final prototype, as well as any spare parts and supplies, as applicable
- software install, to be demonstrated on several machines
- final peer reviews
- Lab notebook containing evidence of individual design contribution

Grading Structure



GRADING SCALE (100%)

% Total	≥ 90	80-89	70-79	60-69	< 60
Letter Grade	A	B	C	D	F

PROJECT PROPOSAL

15%

The proposal describes the problem your team is solving, why it is important and challenging, and what others have already done in this domain. These points will be based on the originality, quality, and feasibility of the proposed computer system design comprising of both software and hardware system as the solution, the analysis of alternative solutions, the consideration of economic and societal aspects, and the project management approach. The proposal grade is divided into three parts: the initial draft (25%), class presentation and critique (25%), and a written proposal report highlighting improvements (50%). The template and detailed rubric will be made available on the course Github.

CRITICAL DESIGN REVIEW

10%

The CDR is a mid-semester evaluation of your project. It incorporates feedback from the proposal and describes in detail the proposed design. The CDR grade is divided into three parts: initial draft (25%), class presentation and critique (25%), and a written CDR report highlighting improvements (50%). The template and detailed rubric will be made available on the course Github.

WEEKLY PROGRESS

10%

This grade will be based on your team's ability to manage weekly meetings and maintain the project on schedule. Each team uploads a weekly report on GitHub by 5 PM on the day before the weekly meeting. The team leader will be responsible for leading the discussion during the weekly meeting, and encouraging members to participate. The team must appoint scribe(s) for generating the weekly progress reports based on the minutes of the meeting. Grading will be based on the quality of the reports and the ability to keep the project on schedule. The template will be made available on the course Github.

FINAL COMMUNICATION

10%

The final communication incorporates feedback from the CDR and describes the final solution in detail. It provides detailed experimental tests and validation results, engineering notes, and a user manual (readme). It also discusses the constraints the team had to satisfy (e.g., cost, time, technology limitations) and relevant industry standards used (e.g., coding, interfaces, safety). The grade is divided into two parts: written report (75%) and class presentation (25%). The template and detailed rubric will be made available on the course Github.

PROJECT DEMO

15%

A grade will be assigned to your project based on the completion of all the objectives stated in your proposal, as well as on a live demonstration in class. The complexity of your project and the size of your team will be factored in. The demos will take place in the class of the week prior to final presentations to IAP.

TEAMWORK

5%

Accomplishing the technical objectives of the project is not sufficient. Your team should also work effectively. A grade will be assigned based on the ability of your group to function as a team, manage roles and responsibilities, and resolve conflicts. Teams are more successful when they work together in the same physical space and integrate components frequently. Being physically present in the same room encourages collaboration and equal distribution of workload. Siloing is a recipe for unwanted surprises! Your team should create and agree on a regular work schedule, with even workload distribution and clearly defined responsibilities

Team Grading Details

65%
GRADE





TEAMWORK REFLECTION

5%

You will complete a teamwork reflection assignment based on the required textbook The Five Dysfunctions of a Team: a Leadership Fable. The Google Form link to submit will be posted on Slack.



TECHNICAL SURVEY

5%

You will submit an annotated bibliography that covers a particular technical/scientific topic that is critical to the project and your technical duties on the team. The survey should cover both background material (e.g., fundamentals, theory, history) as well as related work (i.e., other people working on similar problems) and not overlap with other teammates. References should be from credible sources (e.g., peer-reviewed articles, patents, textbooks, technical reports), as opposed to blogs, posts in social media, or other self-authored sites. You will include 1-2 paragraphs for each reference summarizing its content and relating it to your project. The grade will be averaged over two iterations: an initial submission with 4+ references and an expanded submission with 8+ references. Submit a printed hardcopy in the lab.



NOTEBOOK

10%

Design notebooks help you collect ideas, provide continuity between work sessions, and stay on track with the project. You are required to maintain an individual design notebook to collect any information relevant for the project including ideas, references, designs, and discussions. Your notebook may be paper (must be bound) or electronic. Your grade will be based on the evidence of engineering design (e.g., sketches, block diagrams, schematics, pseudo-code, experimental results, formal derivations), the regularity of your entries during the semester, and the clarity, legibility, and organization of your notebook. You MUST carry your Design Notebook to every weekly meeting. It will be averaged over 4 notebook checks throughout the semester: 3 random checks during weekly meetings and 1 check on completion.



PEER REVIEW

10%

Your performance will be evaluated by each of your team members throughout the semester. Peer reviews will be submitted on Google Forms. Your grade will be a function of the quality of the review you provide as well as how you are reviewed by your peers.



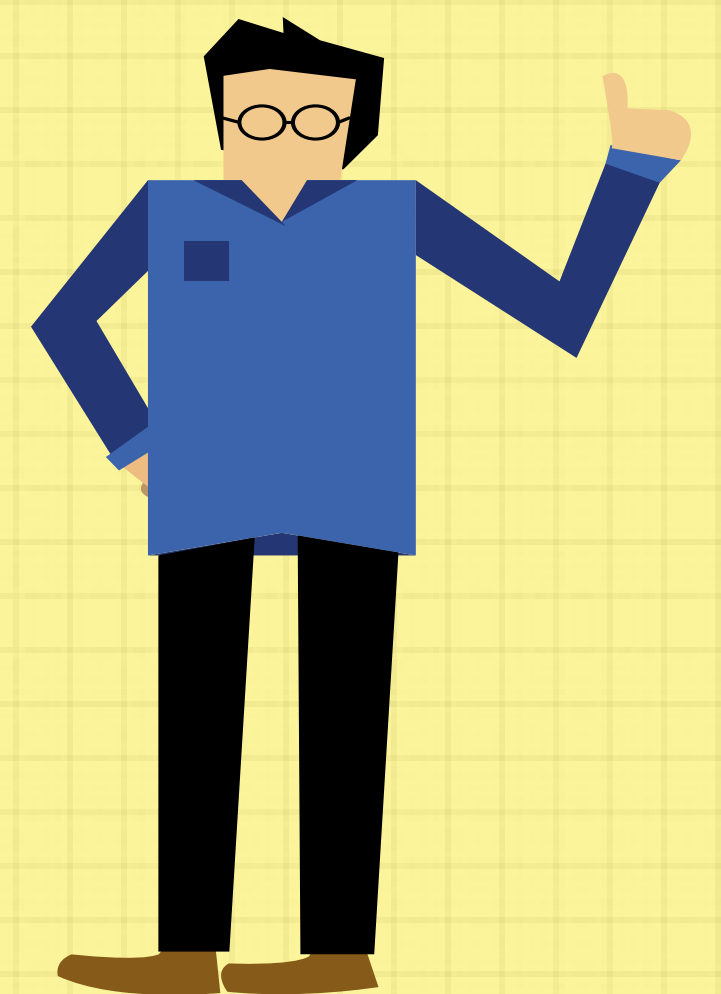
PARTICIPATION

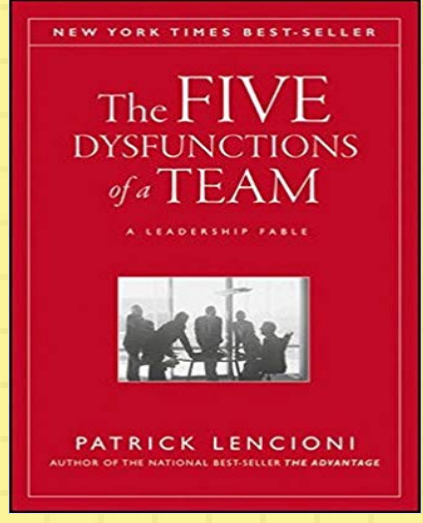
5%

Participation is vital to your team's success. Your grade is a function of your participation in class, GitHub activity, attendance to meetings, engagement in discussions, and contributions to the team to realize overall design project.

Individual
Grading
Details

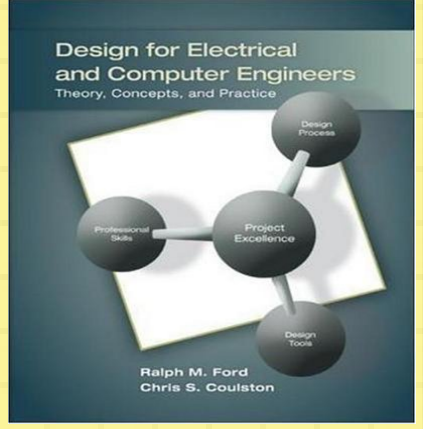
35%
GRADE





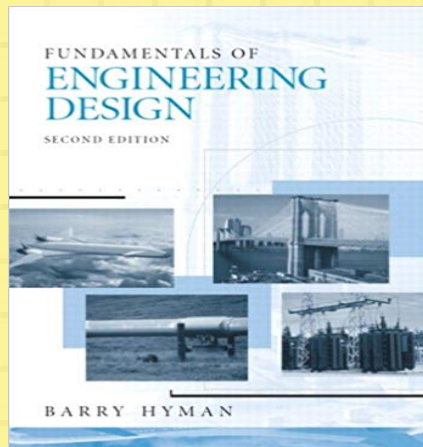
TEXTBOOK

The Five Dysfunctions of a Team: a Leadership Fable
by Patrick M. Lencioni (Jossey-Bass, 2002)
eBook available at TAMU Libraries

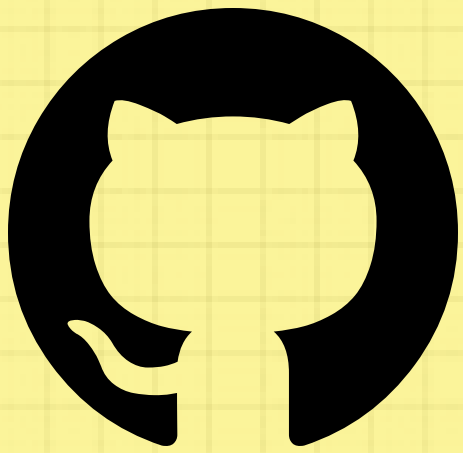


REFERENCE

Design for Electrical and Computer Engineers,
by Ralph Ford and Chris Coulston (McGraw-Hill
Science, 2007)



Fundamentals of Engineering Design, 2nd Ed.,
by Barry Hyman (Prentice Hall, 2003)



COURSE CONTENTS & SUBMISSIONS

GitHub Organization,
<https://github.tamu.edu/sp20-csce483-931>
All required course/lab notes, templates, rubrics, submissions, project management will be done on course GitHub organization. Teams will be created on GitHub who will then be responsible to maintain their design project repository and ensure timely submission. The teaching staff will also be tracking your GitHub activity, as a team and your contributions, for the design project. The Team Leader will be responsible for ensuring all submissions are the latest and on time. The repository must be visible to all team members, the instructor, and the TA.

COMMUNICATION

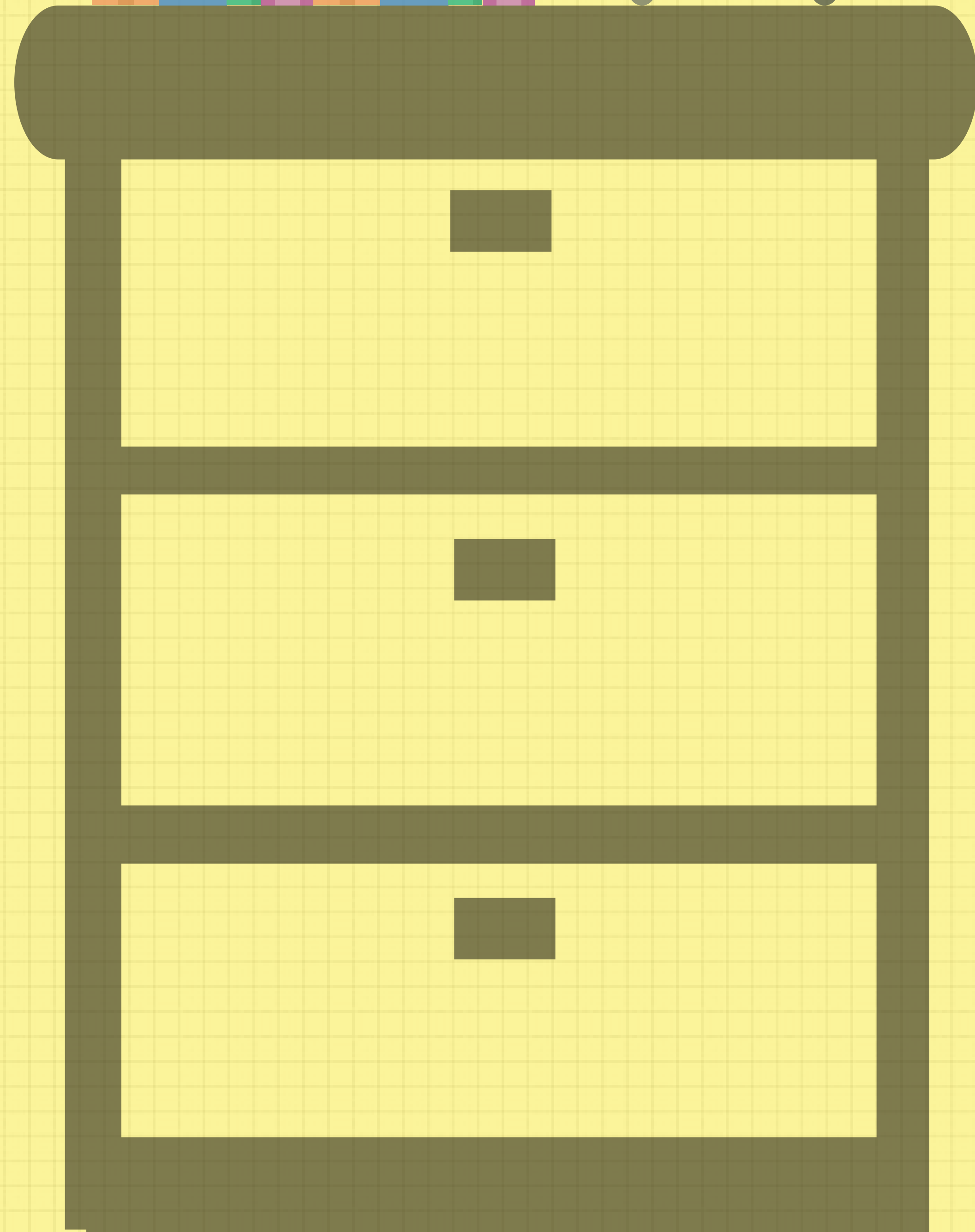
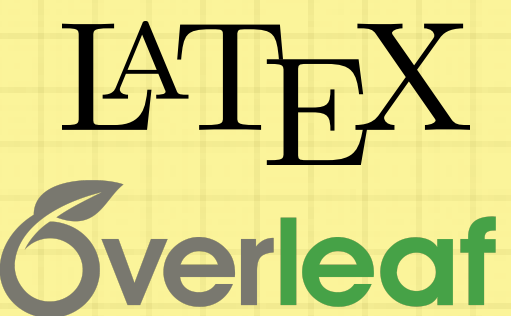
Slack Workspace,
Name: **sp20-csce483-931-csd**
*Slack will be our official means of communication for all course-related topics outside regular class and lab meetings. Please refer to the introductory email on the class listserv to join Slack workspace for our course. You may look up channel #slack-help in Slack to get started. To reach out to the teaching staff digitally, you may DM (direct message) us on Slack for a prompt response. Download and install both mobile and desktop apps for Slack. **Avoid email unless absolute necessary***

DOCUMENT PREPARATION

LaTeX
All major documents should follow the LaTeX templates provided on our class GitHub. We encourage the team members to use Overleaf, an online LaTeX editor (free version), to collaborate on LaTeX documents. Documents such as the proposal, CDR, and the final report must be submitted as both tex and PDF in the respective folder of the team repository. The final report should ALSO be submitted as a hardcopy in a professional format (e.g., spiral-binding). Don't forget to run spell check before submitting.

COMPUTER

Personal Laptop
BYOD to every class and lab for class activities, lab work, etc. BYOD is an initiative in the college of engineering where students are required bring their own computing device to class and labs.



Late Policy & Attendance



Late Policy

Submission time is the timestamp recorded while uploading the assigned work on GitHub. Late work is defined when the submission time exceeds the due date and time.

Email submissions will not be accepted. It is your responsibility to make sure that the submission process is completed and that the correct document report is submitted to the correct place.

For team-based submissions (reports and slides) on GitHub, such as Project Proposal, CDR, Weekly Progress Reports, and Final Report, LATE WORK WILL NOT BE ACCEPTED UNDER ANY CIRCUMSTANCES. We believe that team leader along with the team members should make sure that submissions are on-time in case any member of the team is not available. It is the responsibility of every person to keep other team members, especially, the team leader aware of one's unavailability or absence.



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 or meeting, 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

Weekly Agenda

Week	Date	Lectures and Events	Materials Due	Date	Lectures and Events	Materials Due
1	1/14/20	Introduction + Syllabus + Logistics		1/16/20	L1 (Design) + L2 (Needs) + L3 (Requirements)	Entrance Survey, Resume
2	1/21/20	L4 (Concept Generation) + L5 (Functional Decomposition) + Teams Announced		1/23/20	L6 (Behavior Models) + L7 (Testing) + Lab Begins	
3	1/28/20	L9 (Teams) + Weekly Team Meetings Begin + Lab		1/30/20	L10 (Management) + Lab	Proposal: Problem Statement
4	2/4/20	L11(Ethics) + Lab	Notebook Check, Teamwork Reflection	2/6/20	L12 (Giving Presentations) + Lab	Notebook Check, Annotated Bibliography
5	2/11/20	Proposal Presentations		2/13/20	Proposal Presentations	
6	2/18/20	Weekly Team Meetings (A) + Lab	Proposal: Report	2/20/20	Weekly Team Meetings (B) + Lab	Peer Review 1
7	2/25/20	Weekly Team Meetings (A) + Lab		2/27/20	Weekly Team Meetings (B) + Lab	
8	3/3/20	Weekly Team Meetings (A) + Lab	Notebook Check	3/5/20	Weekly Team Meetings (B) + Lab	Notebook Check, Expanded Annotated Bibliography
—		Spring Break				
9	3/17/20	CDR Presentations		3/19/20	CDR Presentations	
10	3/24/20	Lab	CDR: Report	3/26/20	Weekly Team Meetings (A+B) + Lab	Peer Review 2
11	3/31/20	Lab		4/2/20	Weekly Team Meetings (A+B) + Lab	
12	4/7/20	Lab	Notebook Check	4/9/20	Weekly Team Meetings (A+B) + Lab	Notebook Check
13	4/14/20	Lab		4/16/20	Weekly Team Meetings (A+B) + Lab	Peer Review 3
14	4/21/20	Interactive Project Demos	Project Demo	4/23/20	Buffer Day	Industry Presentation Slides
15	4/28/20	Redefined day, no class		4/29/20*	Industry Presentations (Time/Location TBD)	
				5/1/20*	Final Checkout 8AM-11AM	Peer Review 4, Notebooks, Final Report, All Project Deliverables

* These dates set by the university and the department are not on Tuesday/Thursday.

MEET THE STAFF



GTF

Jyotikrishna "JD" Dass

PhD candidate, Dept. of CSE
Graduate Teaching Fellow

Office Hours:

Wed: 11 AM - 12 PM or by appointment
@HRBB 514A

Correspondence: DM on Slack

Email (if absolute necessary):
dass.jyotikrishna@tamu.edu



TA

Karl Ott

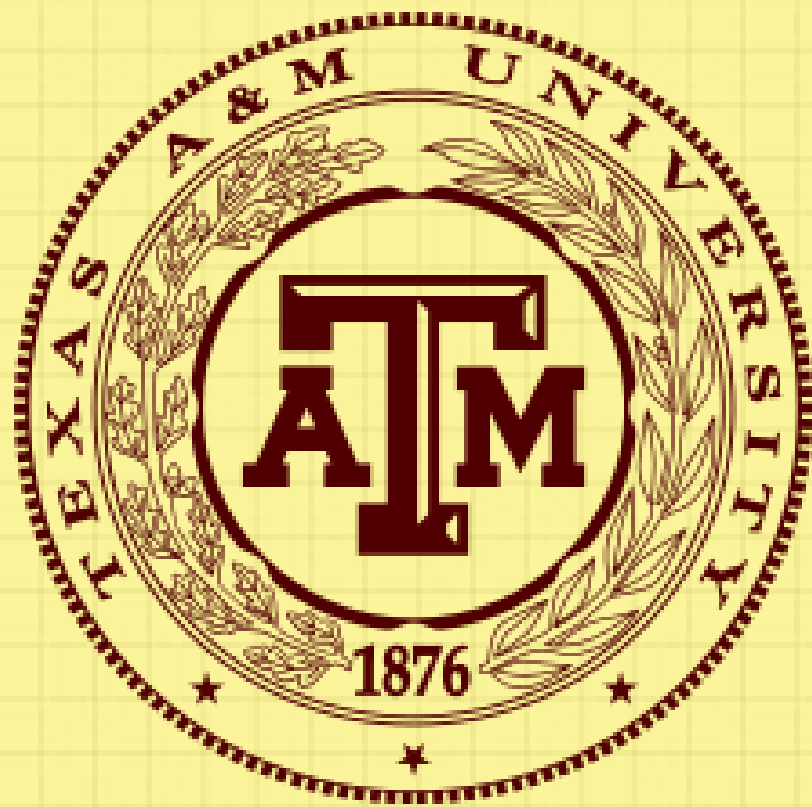
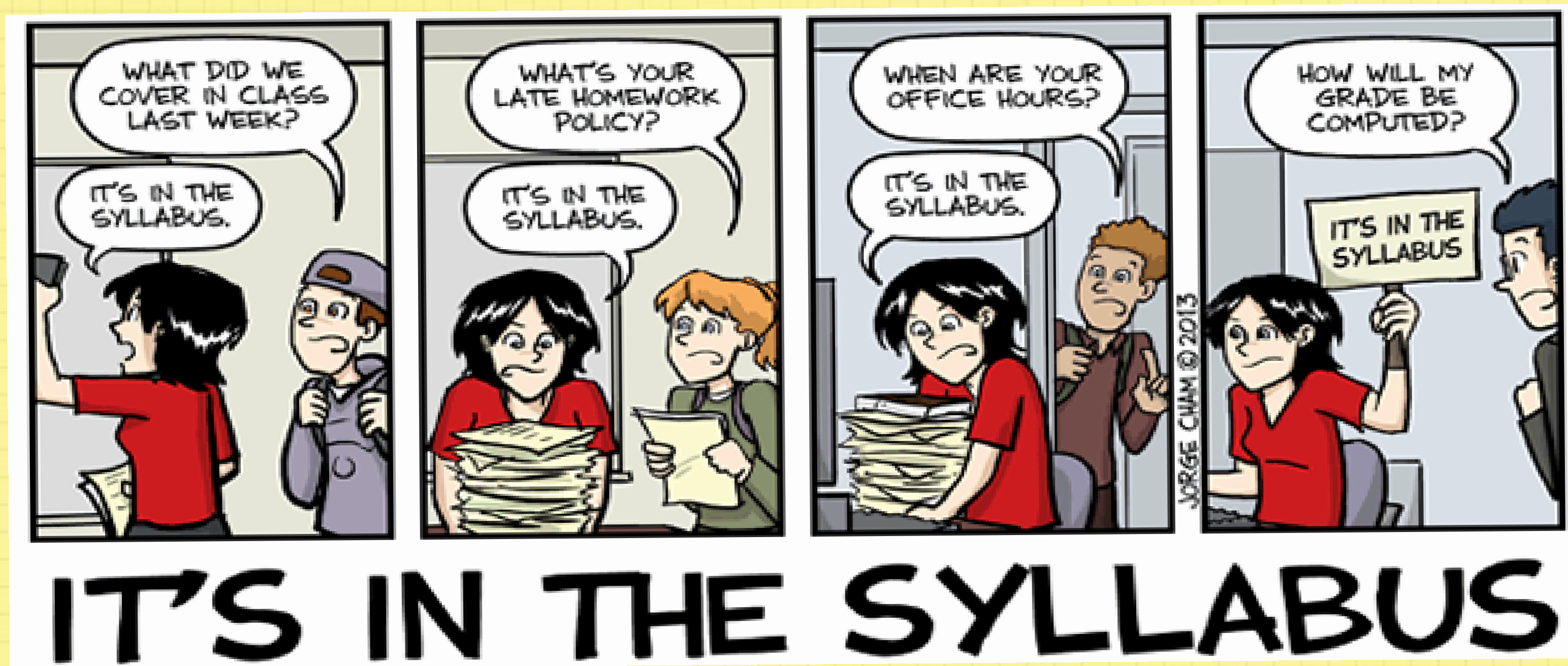
PhD candidate, Dept. of CSE

Office Hours:

Available during Lab times and via
appointment.

Correspondence: DM on Slack

Email (if absolute necessary):
kaott@tamu.edu



AGGIE HONOR CODE

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

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



ADA

Americans with Disabilities Act Policy Statement

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at **(979)845-1637** or visit **<http://disability.tamu.edu>**. Disabilities may include but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Resources and their instructors as soon as possible.

ACKNOWLEDGEMENT

The instructor would like to acknowledge the help and support provided by various faculties, directly and indirectly, to design the course curriculum. The course structure has been inspired by previous and current offerings of the CSCE 482/483 by Dr. Dylan Shell, Dr. Rabi Mahapatra, Dr. Shawna Thomas, Dr. Robin Murphy, and Dr. Ricardo Gutierrez-Osuna. The instructor also appreciates the immense contribution and experience of our TA, Karl Ott, in helping to run this course.