Syllabus

Programming Studio

It is estimated that Windows XP has 50,000,000 lines of code. The average mobile phone has over 10 million lines of code. The average developer writes 10 – 20 useful lines of code per day, so a couple of engineers and 2 friends could break away, start a new company, and create a new "Windows" operating system in only about *1700 years*. That's not reasonable.

Up until now, most of the programs that you have been asked to write could probably fit in your mind. When you complete the letter, you fold it, seal it up, and mail it off (or hit send). But now it is plain to see that products that you use daily simply could not be recreated by you and 10 of your best friends in an afternoon, weekend, or semester. A 1700-year project is wildly unreasonable. There must be a better way.

In this course, you will learn a better way. You will dive into the world of software engineering and hone your teamwork (and, yes, coding) skills. Effective teamwork is essential, and software design methodologies make development more efficient. This course gives you very practical skills for being an effective member of a development team and producing high-quality, sustainable software. Learning these methods of working together, managing requirements, producing quality software products, and testing, delivering, and maintaining these products is every bit as valuable as coding.

Why I Teach this Course

This course is offers you a unique learning experience. I am always especially excited to teach this course, and here is why:

- Building software is fun and rewarding
  You get many opportunities to "learn by doing"
- There's more to software than just coding
  You get a taste of software engineering
- Working on teams can be messy, but it's worth it
  It is amazing what you can accomplish together, so much more than on your own

Course Information

Course Number: 315
Course Title: Programming Studio

Credit Hours: 3 (2 Lecture Hours, 2 Lab Hours)

Lecture:

- Sections 900-903: Face-to-Face, Mondays, Wednesdays, and Fridays 9:10 am-10:00 am, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 244
- Sections 904-907: Face-to-Face, Mondays, Wednesdays, and Fridays 10:20 am-11:10 am, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 244

Lab:

- Section 900: Face-to-Face, Tuesdays and Thursdays 8:25am-9:15am, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 584
- Section 901: Face-to-Face, Tuesdays and Thursdays 9:35am-10:25am, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 584
- Section 902: Face-to-Face, Tuesdays and Thursdays 11:35am-12:25pm, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 584
- Section 903: Face-to-Face, Tuesdays and Thursdays 12:40pm-1:30pm, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 584
- Section 904: Face-to-Face, Tuesdays and Thursdays 8:25am-9:15am, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 596
- Section 905: Face-to-Face, Tuesdays and Thursdays 9:35am-10:25am, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 596
- Section 906: Face-to-Face, Tuesdays and Thursdays 11:35am-12:25pm, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 596
- Section 907: Face-to-Face, Tuesdays and Thursdays 12:40pm-1:30pm, **Zachry Engineering Education Complex (https://aggiemap.tamu.edu/?bldg=0518)** 596

Final Exam Schedule (https://registrar.tamu.edu/Courses,-Registration,-Scheduling/FinalExamination-Schedules#0-Spring2022):

- Final project demonstrations will happen during the scheduled time for your class **LECTURE and LAB. Be prepared to attend both final sections.**

Instructor Details

Instructor: Robert Lightfoot

Office: 422 Peterson

Phone: 979-845-2611

E-Mail: Use Canvas email for all class questions. For help, copy instructor and TA.

Help/Office Hours: email for appointment

Teaching Assistants

- Shuaifang Wang and her email is wangshuaifang@tamu.edu.
- Thomas Rost and his email is thomas.rost.99@tamu.edu.
- Hayden Roper and his email is haydenroper@tamu.edu.
- Robert Hinck and his email is rob.hinck@tamu.edu.

Course Description

Intensive programming experience that integrates core concepts in Computer Science and familiarizes with a variety of programming/development tools and techniques; students work on 2 or 3 month-long projects each emphasizing a different specialization within Computer Science; focuses on programming techniques to ease code integration, reusability, and clarity.

Course Prerequisites

CSCE 312 and CSCE 314; or CSCE 350/ECEN 350

Corequisite: CSCE 313

Special Course Designation

W (writing intensive course)

As a writing intensive course, you will receive instruction on writing and complete writing assignments so you can master writing related to the major. **You must pass the writing components with a C or better to earn a grade in the course.**

Course Learning Outcomes

This course is intended to be an intensive programming experience that integrates core concepts in Computer Science and familiarizes you with a variety of programming/development tools and techniques. You will primarily work in small teams on projects emphasizing different specializations

within computer science. The course focuses on honing good programming techniques to ease code integration, reuse, and clarity. The primary goal for this class is for you to emerge with strong programming skills, able to address both individual and team programming challenges competently. In this course, you will improve your programming skills through significant practice.

After this course you will be able to:

- **Explain** the need for software engineering through industry examples *and personal experience*
- **Exercise** the fundamental concepts of software construction (including managing requirements, design, implementation, testing, and deployment)
- **Design and develop** software that is clearer, more maintainable, and integrates current software technologies
- **Collaborate and communicate** effectively in small teams
- **Recognize and apply** characteristics of effective technical writing

We will cover many topics including:

- Software system design for portability, performance, and testability
- Coding layout and style considerations
- Programming specifications and documentation
- Use of basic software tools and APIs
- Subject-specific topics related to the team projects (DB, HCI)

Though many topics will overlap, this course is not intended to be as in-depth or comprehensive as a standard software engineering course. For a deeper understanding of software development and project management, take software engineering after completing this class.

Required Textbooks

Code Complete, 2nd edition **(https://go.oreilly.com/TAMU/library/view/-/0735619670/?ar)** by Steve McConnell (Microsoft Press, 2004).
(Code Complete PDF) **(http://aroma.vn/web/wp-content/uploads/2016/11/code-complete-2nd-editionv413hav.pdf)**

Database Design, 2nd edition **(https://opentextbc.ca/dbdesign01/)** by Adrienne Watt (BCcampus Open Education, 2014).
(Database Design PDF) **(https://opentextbc.ca/dbdesign01/open/download?type=pdf)**

Other supplementary material as needed will be supplied electronically.

Grading Policy

Grading Components:

Your grade for this course reflects your mastery of course material and is determined by multiple components. As a writing course, **you must pass the writing components with a C or better to earn a grade in the course.** Failure to pass the writing components with a C or better results in an F for the course.

Team Projects – 40%: Two major projects, each worth 20% of the course grade, for 40% total. Specific grading practices for each project will be announced when that project is given out. Your individual contribution determined from logged code commits, peer evaluation, and instructor/TA observations will be a significant contributing factor to these project grades.

Individual Project – 5%: The individual project will be completed prior to the team projects. Specific grading practices will be announced when the assignment is given out.

Written Elements – 35%: This is a writing intensive course. You are required to pass this component with a C or better to earn a grade in the course. You will have several written assignments within the projects (roughly 10% from the individual project, 12% from the first team project, and 13% from the second team project). Specific grading practices will be announced when each assignment is given out.

Other Course Activities – 20%: The course has several different types of activities to help you better understand concepts and connect with the material. This includes (but is not limited to) athome activities, in-class activities, and lab activities. These activities bring deeper, longer-term learning as you work, either individually or with other students. For submitted assignments, grading will be based on the quality of the submitted work. **For group assignments, your full participation is required to receive a grade for that assignment**. This component will be divided as follows: 10% in-class activities (lowest grade dropped), 5% lab activities (lowest grade dropped), 3% at-home activities, and 2% in-class knowledge checks (lowest two grades dropped).

Grading Scale:

Grades will be assigned according to the following scale: A >= 90 > B >= 80 > C >= 70 > D >= 60 > F

These grades represent varying degrees of achievement (see the **university's grading system (https://registrar.tamu.edu/Transcripts-Grades/Grades#0-GradingSystem)**): A = excellent, B = good, C = satisfactory, D = passing, F = failing

Stacked Honors Section:

The stacked honors section will explore course concepts more deeply through readings, discussions, reflections, and projects. They will have honors-only lecture sessions on the first Friday of each month.

Submission of Assignments:

All assignments will be turned in electronically though **Canvas (https://canvas.tamu.edu/)** (unless otherwise specified) by the due date and time given on the assignment. Email submissions will not be accepted.

Late Work Policy

Assignments turned in after the posted deadline will have a penalty applied of 5% per day late. For team assignments, the late penalty affects the grade for the entire team. If the assignment is individual, the late penalty only affects the grade for that team member.

Course Schedule

The course is listed as a 2-hour per week lecture, and 2-hour per week lab, however it has been intentionally scheduled for 3 hours per week of lecture (along with the lab). We will meet approximately 2/3 of the lecture periods over the course of the semester. After the first week of class, the regular sections will only meet on Mondays and Wednesdays with Fridays reserved as optional workdays. The honors section will also meet the first Friday of each month for deep dive discussions.

Below is the **planned but tentative** schedule of topics and major projects for the course. All assignment and project details will be communicated on **Canvas (https://canvas.tamu.edu/)** .

Week	Lecture Topics	Lab Topics	Project Deliverables ***(due Monday midnight at beginning of week unless otherwise noted)***
1	Introductions, Professional Presence	No labs	
2	Software Construction and Design	HTML, Javascript, CSS, using git	
3	Software Development Methodologies, Waterfall	HTML, Javascript, CSS	Project 1 Version 1
4	Databases, Team Success	Database design diagrams, AWS database interaction	Project 1 Version 2

5	Code as Communication, Style Guides, Technical Writing	Database population	Project 2 Phase 1
6	Collaborative Development, Formal Inspections	Project 2 demos, connecting database and GUI	Project 2 Phase 2, Project 2 Status Update* (due Wed. midnight)
7	Testing/Debugging/Refactoring	Project 2 demos	Project 2 Phase 3
8	Commenting and Automatically Generated Documentation, Agile	Project 2 demos, user stories	Project 2 Phase 4, Project 2 Retrospective Reports* (due Wed. midnight)
Spring Break			
9	Design Thinking and Ideation	APIs, Sprint artifacts	Project 3 Proposal* (due Sun. midnight at end of week)
10	User Studies, Prototyping	Full stack development, advanced git	
11	Accessibility, Integration and Configuration Management	User studies	Project 3 Sprint 1 Materials* (due Wed. midnight)
12	Workdays	Workdays	Project 3 User Study 1, Project 3 Status Update* (due Wed. midnight)
13	Team Meetings	Team meetings	Project 3 Sprint 2 Materials* (due Wed. midnight)
14	Workdays	Workdays	Project 3 User Study 2
15	Course Wrap-up, Final Presentation Instructions	No labs	Project 3 Sprint Materials, Project 3 Retrospective Reports* (due Wed. midnight)
Finals	Project 3 Final Presentations		

University and Course Policies

Attendance Policy

The university views class attendance and participation as an individual student responsibility. **Students are expected to attend class and to complete all assignments.**

Please refer to **Student Rule 7 (https://student-rules.tamu.edu/rule07/)** in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to **Student Rule 7 (https://student-rules.tamu.edu/rule07/)** in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" **(Student Rule 7, Section 7.4.1 (https://student-rules.tamu.edu/rule07/)).**

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" **(Student Rule 7, Section 7.4.2 (https://studentrules.tamu.edu/rule07/)**).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24 (https://student-rules.tamu.edu/rule24/)).

Students should ***submit excused absence documentation to the Canvas course*** *(Modules -> Student Resources -> Excused Absence Documentation).*

Communication Policy

We will use **Canvas (https://canvas.tamu.edu/)** to post assignments, course resources, discussions, and send announcements. **It is your responsibility to check Canvas and pay attention to class emails and announcements.**

Bring Your Own Device Policy

BYOD is an initiative in the College of Engineering where **students are required bring their own computing device to lecture and lab**. You need to have a computing device with a headset,

microphone, and webcam. You will also need stable internet access outside of lecture and lab. See the **BYOD webpage (https://engineering.tamu.edu/easa/areas/academics/byod)** for information on the program, approved devices, and financial assistance. BYOD devices fulfill the requirements for this class.

Academic Integrity Statement and Policy

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

“Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one’s work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case”

(**Section 20.1.2.3, Student Rule 20 (https://aggiehonor.tamu.edu/Rules-andProcedures/Rules/Honor-System-Rules)**).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at **aggiehonor.tamu.edu (https://aggiehonor.tamu.edu/)**.

All suspected academic misconduct is taken seriously and will be reported to the Aggie Honor System Office.

For this class, certain aspects of the honor code need to be clarified:

1. **External code/software/libraries:** There will be times in this course where you or your team make use of external code/software/libraries. Whenever this is done, you must make sure that you: follow any licensing and/or use restrictions that library/code requires and clearly document what the source of the external code was, and how it was used. *Failure to follow licensing or usage restrictions or neglecting to clearly document usage is an honor code violation.*
2. **Outside assistance:** There may be times in this course where you or your team would like to seek outside assistance related to projects and assignments. Any assistance from any person other than members of your team, the instructor, teaching assistants, or peer teachers **needs prior approval from the instructor** and needs to be clearly documented. This also includes online websites and material. **Do not assume that if you have access to something that it is approved.** *Using unapproved outside assistance of any kind is an honor code violation.*
3. **Working in teams:** You will be working in team environments in this course, and your work as a team will be used to determine grades. As such, it is your responsibility, when asked, to: ○ **Accurately describe the work that you have done on a team project.** *Claiming credit for work that you have not done or that others did instead is an honor code violation.* ○ **Accurately describe (to the best of your knowledge) the performance of other team members.** “Covering” for another team member (claiming they did more work than you know they did, or

exaggerating the work they did) or “spiking” them (claiming they did less work than you know they did, or purposefully minimizing the work they did) are *examples of honor code violations.*

- **Prevent (as best you can) or report (known or suspected) violations of the honor code by your other team members.** You share responsibility when a project is turned in; *if you are aware of a teammate having violated the code in his/her work on the project, and do not report it, you are claiming credit for that violation yourself*.

If there are any questions or concerns about whether an action is appropriate, you should check with the instructor or teaching assistant first. **If in doubt, assume that the action is not appropriate.**

Americans with Disabilities Act (ADA) Policy

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 office on your campus (resources listed below). 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.

Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit ***disability.tamu.edu*** **(https://disability.tamu.edu/)*.***

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions **(**see **University Rule 08.01.01.M1 (https://rules-saps.tamu.edu/PDFs/08.01.01.M1.pdf)**):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class

discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with ***Counseling and Psychological Services*** **(https://caps.tamu.edu/)** *(CAPS).*

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's ***Title IX webpage*** **(https://titleix.tamu.edu/)** ***.***

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing available resources and services on your campus.

Students who need someone to talk to can contact ***Counseling & Psychological Services*** ***(https://caps.tamu.edu/)*** *(CAPS) or call the* ***TAMU Helpline (https://caps.tamu.edu/helpline/)*** *(979845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at* ***suicidepreventionlifeline.org*** **(https://suicidepreventionlifeline.org/)** ***.***