

CSCI 360

Software Architecture & Design Spring 2020

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Office: Harbor Walk East, Room 312
Office Hours: T/TH 10:30 – 12:30 or by
appointment

Overview

This course covers the process of constructing software, including the structural views of software components, and their characteristics and interrelationships, at a high level of abstraction. The course also covers the design principles that govern the purpose, structure, development and evolution of software components. The informal laboratory component of the course uses software design tools to reinforce design processes and associated design representations.

Prerequisites: CSCI 230 (C- or better grade).

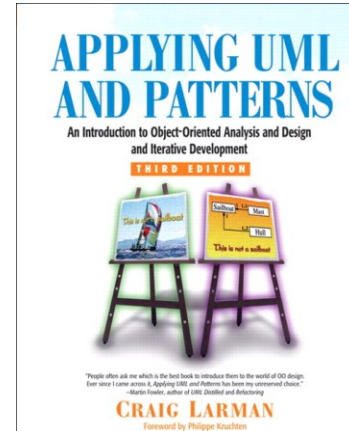
Prerequisite or co-requisite: COMM 104.

Outcomes

After completing CSCI 360 students will be able to:

1. Judge legal issues in software projects
2. Construct UML diagrams
3. Apply UML diagrams in different phases of a software engineering project
4. Formulate the requirements and specifications for a software project
5. Examine software architectural styles
6. Apply appropriate design principles to software projects
7. Build software with OO Design principles
8. Compare different software designs
9. Design and implement software test cases
10. Explain the software lifecycle and how it applies to different projects
11. Build GUIs for enhanced user experience
12. Understand the importance of project management in software
13. Distinguish software design patterns
14. Design software projects considering security, performance, usability, and data integrity.

Materials



Required book:

“Applying UML and Patterns”, *Craig Larman*. ISBN-13: 978-0131489066, ISBN-10: 0131489062.

Reading assignments and exercises will be taken from the textbook.

Other books you may find useful:

“*The Mythical Man Month*”, *Frederick P. Brooks, Jr.*
Addison-Wesley, 1972

Software:

1. UML: Use any tool that generate make diagrams.
I recommend: draw.io.
2. Java: NetBeans or Eclipse or IntelliJ IDE
3. GitHub (<https://github.com/>)

Class Meeting Times: Tues 17:40 – 20:25

Class Location: HWEA 105F

Office hours: T/TH 10:30 – 12:30

Office Location: HWEA 312

Course Website:

<http://mountrouidou.people.cofc.edu/CSCI360/index.html>

We will use Oaks for assignment submission and grading.

Evaluation

Midterm	20%
Final	30%
Project	35%
Homework	10%
Participation	5%
Total	100%

Your weighted average will result in a letter grade assigned per the usual scale:

A: 93%-100% A-: 90%-93%

B+: 87%-90% B: 83%-87% B-: 80%-83%

C+: 77%-80% C: 73%-77% C-: 70%-73%

D+: 67%-70% D: 63%-67% D-: 60%-63%

F: below 60%

➤ Homework

- ❖ Homework assignments will be based on your reading and will prepare you for your project.
- ❖ You may complete the homework assignments in *teams of maximum two members*.
- ❖ You will have approximately one homework assignment every two weeks.

➤ Project

- ❖ The project will be completed by *teams of minimum two, maximum four students*.
- ❖ The topic of the project will be the design and implementation of a fitness tracker software system.
- ❖ Note: ALL team members need to work on the code and the design of the software system.
 - You may receive a different grade than your teammates if you have not worked at all on code or design documentation.
 - You may receive a different grade than your teammates if you have not completed your fair share of the work.
 - You may submit a peer review regarding yours and your teammates' performance at the end of the semester. Depending on the outcome of your review, your grade may change even for past deliverables that were submitted before the peer reviews.

➤ Exams

- ❖ There will be two exams: one midterm and one *cumulative* final.
- ❖ Exams are closed book.
- ❖ *You may use one cheat sheet*, i.e., a US Letter page written in front and back.

➤ Participation:

- ❖ Participation will be the average of your attendance, Kahoot quizzes, and active in class participation.

- ❖ You need to actively answer and ask questions during class to earn active in class participation points.
- ❖ The participation points are dependent on my discretion based on your attention and active preparation

Late Submissions

- Deadlines are firm.
- You may submit **up to two days late with 20% penalty for each day that you are late.**
- *A score of zero will be assigned to any project/homework that has not been submitted within two days after the deadline.*

Re-grading

If you have a request for re-grading, you need to ask me to re-grade your exam or homework up to one week (five business days) after this has been returned to you. *There will be no re-grading if the exam/assignment is older than one week.* I reserve the right to re-grade the full exam/assignment. This means that I will not re-grade only the part you have requested, but the whole exam/assignment and add or reduce points accordingly.

Missed Exams

If you miss an exam, the only way to take this exam on a different day is to have an official document (ex. from doctor, coach) verifying the reason you had to miss the exam AND to let me know with an email BEFORE the exam, that you will miss it. Please refer to the student handbook “Class attendance policies” for a more detailed description of excused absences. A reason to miss the exam may be a health issue, a sports tournament you had to participate, or an important personal issue. I will consider rescheduling on a case-by-case basis.

Attendance

Regular attendance is expected of all students. For any grade to be awarded, participants must attend at least 85% of the class hours. Participants are expected to attend all sessions, ***be punctual***, and remain for the duration of each class. In the rare case where some absence is required, make up work will be assigned where it is practical to do so. Attendance is also part of the grading scale. Students may be withdrawn by the instructor if absences violate these guidelines.

Schedule

- The schedule is tentative and subject to change during the semester.
- If the College of Charleston closes and members of the community are evacuated due to inclement weather, students are responsible for taking course materials with them in order to continue with course assignments consistent with instructions provided by faculty. In cases of extended periods of institution-wide closure where students have relocated, instructors may articulate a plan that allows for supplemental academic engagement despite these circumstances.

Date	Topics	Readings due	Individual HW Due before class	Team Project Due
Jan. 14	Introduction, Syllabus, Choco Plane	Syllabus		
	OO Analysis & Design, Github tutorial	ch.1, 2, 3		
Jan. 21	Inception, Evolutionary Requirements, Use Cases	ch. 4, 5		Pick teams
	Use cases, Ethical issues, Java FX tutorial	ch. 6		
Jan. 28	Inception to Elaboration, UI design, Java FX tutorial (cont.)	ch. 7, 8	H1 (H = Homework)	
	Domain Models, UI design, Java FX tutorial (cont.)	ch. 9		
Feb. 4	System Sequence Diagrams	ch. 10	H2	D1 (D = Deliverable)
	Operation Contracts, Project Demos	ch. 11		
Feb. 11	Logical Architecture	ch. 12, 13		
	Object Design, UML Interaction Diagrams	ch. 14, 15		
Feb. 18	UML Class Diagrams	ch. 16	H3	
	GRASP	ch. 17		
Feb. 25	GRASP, Midterm Review	ch. 18		D2
	Mapping Designs to Code			
3-Mar	Midterm	ch. 19, 20		
	Test Driven Development & Refactoring, Junit tutorial	ch. 21	H4	D3
10-Mar	UML Activity Diagrams, Databases lab			
	State Machine Diagrams, Databases lab cont.	ch. 28		
17-Mar	Spring Break			
24-Mar	Liskov Substitution Principle, Project Demos	ch. 25		
	GRASP revisited	ch. 29		
31-Mar	Applying Design Patterns, Secure coding	ch. 26		
	Applying Design Patterns, Secure coding			D4
7-Apr	Applying Design Patterns, Secure coding			
	Applying Design Patterns, Secure coding lab	ch. 26		
14-Apr	Software Architecture Document (SAD), Secure coding lab (cont.)	ch. 39		
	Project presentations			
21-Apr	Project presentations			D5
	Final Review			

Honor Code

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when suspected, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This status indicator will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent.

Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

What is plagiarism?

The unauthorized use or close imitation of the language and thoughts of another author and the representation of them as one's own original work, as by not crediting the author. (*Source: dictionary.com*)

As you noticed above, I am citing the Internet source from which I used my information. Plagiarism includes using material from the Internet without citing the website from which you ^[L]_[SEP]got your material. Books, articles and any hard copy sources should be cited as well. ^[L]_[SEP]Plagiarism is considered cheating.

Plagiarism and coding (what you can and cannot do!):

1. You may look up examples on the Internet.
2. You may NOT copy paste code from the Internet and present it as your own. Avoid copy pasting code from the internet and use this as a last resort ALWAYS with citation to the website that you used.
3. You may use libraries that are included in the Java API.
4. If you plan to use a library that is not on the Java API in a project, you will need to discuss this with me.

Discussing solutions with other students: Make sure you apply the “**empty hand policy**”, i.e., do not copy or use material from the discussion, just interact, brainstorm. You *cannot look at someone's code and then type it*. You *cannot share the programs*, write code on a paper and share it with someone, or in

any form whatsoever share your programs.

Collaboration in teams is allowed only if I have explicitly described in the project/homework assignment. You may collaborate based on the principles of pair programming (see below) and only if I have authorized teams. The Honor Code applies to the team members.

My actions after I suspect a cheating:

1. Contact the student and discuss the issue.
2. Consult with the honors committee and proceed to submit the issue with sufficient evidence that the student has cheated.

Pair Programming

Programming projects can be performed in teams of two members. The goal is to learn pair programming principles and extreme programming techniques that are used in industry. This allows the students to learn from each other and learn to collaborate. The main responsibilities for such collaboration are:

1. All the members of the team need to have project ownership, i.e., participate equally in the design, development and documentation. The instructor will ask in depth questions to all members of the team.
2. **All programming must be done in the pair.** Do not continue programming outside the pair. If you can't finish in one session, meet again. If that's impossible, save a copy of the code you pair-programmed for separate submission. Then work alone to finish the code. Review the part you coded alone with the other team members.
3. You need to follow the rules of pair programming, switching roles from observer to driver every 15 minutes or so.
4. All members receive the same grade.
5. A team leader will make the assignment submission. This is just to maintain one submission per team and in no way the team leader should do less or more work than the rest of the team members.
6. Students need to bring up collaboration issues early (first week of assignment) in order to switch teams.

Accommodations for Adults with Disabilities

The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me **one week before accommodation is needed.**

Final Notes

- I have a Greek accent that may be hard to understand sometimes. Please do not hesitate to ask me to repeat something.

- If you need to record the class, you may do this with your phone provided that you do not disturb the class.
- Please respect your classmates. Put your phone in silent mode before the lecture starts.