

Course Syllabus

CS4471B: Software Design and Architecture
Department of Computer Science
Fall 2022

Tuesday, August 30, 2022

Description

This course is required for the development of stable and dependable software. It begins with a review and discussion of software design issues before moving on to design patterns. It then provides a summary of architectural structures and styles. There will be a focus on the relationship between quality attributes and software architecture. Students will also experience design pattern application examples and software architecture case studies.

Objective – The learning objectives for the course are the following:

- Understand and apply object-oriented design techniques
- Develop and evaluate software architectures
- Select and use appropriate architectural styles
- Select and use appropriate software design patterns
- Express the specifications and design of an application using UML

Course Team

- Instructor: Ahmed Ibrahim
 - Office: TBA
 - Email: aibrah64 at UWO.
 - Office hours: Friday from 2:00 pm to 3:00 pm
- See OWL for TA office hours.

Meeting Times and Places

- The course lecture is held in SEB-2202. It will begin at 10:30 am and end at 1:30 pm on Friday.

Contact

- The best way to get help is via email. Please try not to leave your questions until the last minute. Prefix the subject line with CS4471 for a prompt reply.
- Please follow the email policy listed below.
- TA emails will be listed on OWL.

Prerequisite – This course has the following prerequisite(s): CS3307 (Object-Oriented Design and Analysis)

Textbook

While the course does not have a required textbook, much of the materials will be sourced from the following reference books. Some of the lecture material was adopted from these books.

Reference Books

- Ian Sommerville, "Software Engineering," 10th Edition, Addison-Wesley.
- C. E. Otero, "Software Engineering Design: Theory and Practice," CRC Press
- Len Bass, Paul Clements and Rick Kazman, "Software Architecture in Practice", 3rd edition, Addison-Wesley, 2012
- Humberto Cervantes and Rick Kazman, "Designing Software Architectures: A Practical Approach", Addison-Wesley, 2016

Tentative Course Schedule

Week #	Topic	Activities
1	Course intro. & Admin. Architecting Process and Architecture Views	N/A
2	Architecting Process and Architecture Views	N/A
3	Architectural Decomposition	Quiz #1 Assignment #1 release
4	Architectural Patterns	N/A
5	Architectural Patterns	N/A
6	Architecture Recovery & Evaluation	Assignment #1 due Quiz #2
	Reading week. No classes.	N/A
7	Architecture Recovery & Evaluation	Assignment #2 release
8	Manage the development of your software project	Quiz #3
9	Design Principles & Design Patterns Project orientations	N/A
10	Design Principles & Design Patterns Project orientations	Assignment #2 due
11	Software Visualization Project orientations	Quiz #4
12	Software Visualization Advanced topic(s): Using Machine Learning in Software Development	Project Due (Nov 30)

Note – The proposed topics are subject to change according to the progress of the class.

Lectures

- All lecture slides will be available on the OWL on a weekly basis. And it's the student's responsibility to check the course website regularly, including the announcement section, at least once weekly.
- You are also responsible for all material posted on OWL.

Requirements and Grading

The learning outcomes will be assessed by the required coursework tasks, including:

- Bi-weekly Quizzes (15%): The quizzes will be given during the lecture time. In addition, the top three quizzes will be counted toward the quizzes' grade.
- Assignments (20%)
- Tech-Talk (10%)

- Final Exam (30%):
 - Coverage: it will cover all topics discussed during the semester
 - Date & Time: to be determined by the Registrar's Office.
- Project (25%) – Group work – Nov 30 @ 5:00pm
 - The Project (s) submissions must be a group submission and through a selected single team member.
 - All submissions must be through the dedicated dropbox.

Quizzes

- A missed quiz will receive a zero mark unless there is a valid documented reason. The quiz weight will be carried over only with verifiable extenuating circumstances. An extenuating circumstance is a rare and severe event for which a student has no control or cannot anticipate (for example, a serious accident or emergency medical condition).
- There will be NO MAKEUP for any quiz. The quiz weight will be carried over the next quiz.

Student Absences

- The course instructor is not permitted to accept any documentation related to student absences. All documentation must be handled through the student's home faculty Academic Counselling Office.
- If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.
- Assessments worth less than 10% of the overall course grade:
 - Contact the course instructor directly to grant academic considerations.
- Assessments worth 10% or more of the overall course grade:
 - For work totaling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf
 - The Student Medical Certificate is available at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Passing the course

- To pass the course, you must achieve at least 60% overall in the course and at least 50% on the exams (quizzes, final) combined.

Grading Policy

I am following the University Grading Policy on https://registrar.uwo.ca/academics/grades_progression_and_graduation.html

Late Submission Policy

- 24 hours late: 25% reduction (the percentage is calculated from the maximum possible grade).
- 48 hours late: 50% reduction
- Submissions more than 48 hours late will not be accepted

Note:

- **No course work will be accepted after the last day of classes or after any assignment grades are released.**
- If a student misses a course work due to extenuating circumstances, make sure to contact the instructor as soon as possible. Unauthorized missed coursework will receive a grade of ZERO.
- **Any submission for any course component by email will NOT be accepted.**
- **Individual submission will NOT be accepted** for the course project.

Course Project

- All students will be required to prepare a Course Project; details will be posted later on OWL. Each group will have to deliver a project document and conduct a project demonstration.
- Students must form groups (up to 4 students at most) to work **collaboratively** on the course project. Each group will have a number (GroupID). More information on the due date for submission will be posted online.
- The due date for forming a group is Sep 30 @ 5:00 pm. Posterior to that date, there would be a random allocation for students who have not joined any group yet to groups with available space.
- A "Group Work, Responsibilities, and Peer Review" policy is posted to regulate group work under Project. Please make yourself familiar with it.

UWO Email Account – Our official means of communication is with your UWO email account. Students must regularly check their UWO email account for important notices from the university community. To ensure delivery, students are also expected to send emails to official university community members from their UWO email account.

Email policy

- Your email subject should include "CS4471:" and start with "Hello, professor."
- Last, I check my emails on school days and will reply within **48 hours**. Don't expect any response on weekends or after 7:00 pm on a typical weekday.
- Remember, email is one official means of communication between the students and the course instructor. As with all official University communications, it is the student's responsibility to ensure that time-critical email is accessed, read, and acted upon promptly.
- If a student chooses to forward a university email to another email mailbox, it is that student's responsibility to ensure that the alternate account is viable.
- It is a violation for any user of official university email addresses to impersonate a university officer, faculty member, staff, or student body, in line with the University "**Code of Computer User Conduct**" and relevant federal and state legislation.

Absences from Final Examinations

- If a student misses the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you can do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).
- You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

Religious Accommodation

- When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration.
- Please consult University's list of recognized religious holidays (updated annually) at <https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

Accommodation Policies

- Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf

Academic Policies

- The website for Registrar Services is <http://www.registrar.uwo.ca>
- In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Misc. Items

- Do not share!!!, the program/lab assignment submitted must be written on your own or referenced.
- **No lame excuses.** Please, even when they are true, they are still lame.
- **No extra work in the next semester is given to improve your grade.** The given grades are final.

Good Luck!