Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: CS
Course and Section #: 6500 001
Course Title: Software Architecture
Credits: 3

Course Description

Evaluates software architecture and the high level design of large scale software systems. Explores common architectural styles and patterns. Teaches techniques of documenting and assessing software architectures. Teaches characteristics of software architecture evolution. Evaluates several large-scale software architectures.

Course Attributes

This course has the following attributes:

☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective

Other: *Click here to enter text.*

Instructor Information

Instructor Name: Neil B. Harrison

Student Learning Outcomes

Upon completion of this course, students should be able to:

1. Design software architecture for large-scale software systems.
2. Evaluate major software architectural styles, design patterns, and frameworks.
3. Assess a software architecture using various documentation approaches and architectural description languages.
4. Develop architectural alternatives for a problem and select among them.
5. Apply well-understood paradigms for designing new systems.
6. Evaluate software architectures.

Course Materials and Texts

Recommended Text: Len Bass et al: Software in Practice, 4th ed. https://www.amazon.com/Software-Architecture-Practice-SEI-

Engineering/dp/0136886094/ref=sr_1_1?crid=2KAMHFHWAX70D&keywords=software+architecture+in+practice&qid=1672867805&sprefix=software+architecture+in+practice%2Caps%2C136&sr=8-1

Many other books on software architecture are available.

Course Requirements

Course Assignments, Assessments, and Grading Policy

There will be much interaction in class. You are expected to attend. You will do a lot of discussion in class, so you will be learning from each other. In addition, numerous presentations are required. Therefore, class attendance is required. The class is held at the end of the workday so you can come. Most of the assignments in the course are group assignments. Group projects in college are awful, but there are two compelling reasons for groups in this class. First, software architectural design is by nature a collaborative exercise. You will get much better ideas and stronger designs by working together and bouncing ideas off each other. Second, good architectural documentation is extensive. By working in a group you can share the load.
It is very important that you meet together in your group extensively and in person. Find a group where you can all meet together (and not via Zoom.)
Normally, the groups are formed at the beginning of the semester and will remain the same throughout the semester.

Grading

Software architecture is not an exact science. There are many ways to skin a cat. This means that for most assignments, there is not one right answer. Grading will be based on:

- Completeness: did you account for everything?
- Clarity: is your architecture description easy to understand? A biggie!
- Correctness: does your design appear that it will work?
- Level: is the design at the proper level (sufficient substance, but not excessive implementation detail)
- Individual participation in your group (I recommend that you identify the authors of sections in your assignments.)
- Quality of the presentation (where applicable.)

I understand that the lack of specific grading criteria will cause some of you some anxiety. But that's the nature of software architecture. Don't stress about it.
As graduate students, it is expected that you have already been a good student. Normally, late assignments are not accepted. One important reason is that we often discuss your homework the day it is due. In many cases, you will have to present your homework in class; be prepared to do so.
Assignment, project and exam weights: see CANVAS
Grades will be assigned according to the following schedule:

93 – 100% A
90 – 92% A-
87 – 89% B+
83 – 86% B
80 – 82% B-
77 – 79% C+
73 – 76% C

70 – 72% C-
67 – 69% D+
63 – 66% D
60 – 62% D-
0 – 59% E

You are responsible for knowing all important university deadlines for students (e.g., last day to add/drop, etc.)

Exams
There will be a final; it will be a take-home due the day of finals (much like just another assignment). (Subject to change, of course)

Required or Recommended Reading Assignments
As assigned in class

General Description of the Subject Matter of Each Lecture or Discussion

1. Introduction
2. Abstraction and Ambiguity in software Architecture
3. Foundations of Software Architecture
4. Partitioning
5. Patterns in General
6. Architectural Styles
7. Architecture Patterns
8. Documenting Software Architectures
9. Use Cases
10. Introduction to Quality Attributes
11. Reviewing Architectures
12. Reliability
13. Quality Attribute Workshops
14. Distributed and Cloud Architectures
15. Architectural Evolution

Required Course Syllabus Statements

Generative AI
Click here to enter text.

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the

student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX
Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.