

Syllabus

Course catalog information

Semester: Spring 2025

Course name: Advanced Software Engineering

Course ID: CS 5667

Section number: 101

Credit hours: 3

Modality: face-to-face

Meeting days: MWF

Meeting time: 1:00pm - 1:50pm

Meeting location: 317 Anne Belk Hall

Course description: Review of the system life cycle. Software metrics. System engineering. Analysis and system specification. Object-oriented modeling. Computer-aided software engineering (CASE). Verification, validation and formal specification. Both individual and group projects are required.

Course prerequisites/co-requisites: CS 5666

Instructor information



Instructor name: Dr. Mark Hills

Instructor office: 312-L Anne Belk Hall

Instructor phone: 828-262-7159

Instructor email: hillsma@appstate.edu (<mailto:hillsma@appstate.edu>).

Office hours: Monday 2:00pm - 4:00pm Tuesday 10:00am - 11:00am Wednesday 2:00pm - 4:00pm

Course objectives

In this course we will cover a number of topics related to software engineering. This includes software architecture, continuous integration/delivery/deployment and build pipelines, DevOps, REST and the development of RESTful APIs, software modeling, software verification, and concurrency. Upon completion of this course each student will be able to:

- Apply concepts from software architecture to document and improve quality attributes for software systems;
- configure and use automated build systems, including those delivered as part of cloud solutions;
- understand REST architectures and both develop and use RESTful APIs;
- understand DevOps and utilize DevOps techniques on software projects;

- build concurrent systems using a variety of different approaches to concurrency in Java and other programming languages.

Required materials and resources

Our main text for the course will be Software Architecture in Practice, 4th Edition. This will be supplemented by readings from various other sources, including from three additional texts. These are API Design Patterns, Grokking Concurrency, and Seven Concurrency Models in Seven Weeks. All of these texts are available through the electronic text rental program and can be accessed using the My Materials link near the top of the course.

We will also be using the O'Reilly Learning Platform to access material from relevant books. You can find out more about this here: <https://library.appstate.edu/find-resources/databases/oreilly-ebooks-safari-books-online> (<https://library.appstate.edu/find-resources/databases/oreilly-ebooks-safari-books-online>). You do not need to create an O'Reilly account to use this service, but it can be useful if you wish to use their mobile app. Links to the appropriate chapters of books hosted on the O'Reilly Learning Platform will be provided in the relevant topics on AsULearn. Some of our textbooks are also available there.

We will be keeping track of projects on GitHub: <https://github.com> (<https://github.com>). You will need to create an account there if you have not done so already.

Grades

Students will be evaluated based on several take-home exams, homework assignments including quizzes and paper reflections/discussions, a small group implementation project, and a solo research project.

Grading Scale

Letter	Percentage Required
A	93
A-	90
B+	87
B	83
B-	80
C+	77
C	73
C-	70
F	< 70

This grade is based on the following relative weights of the various activities:

Weighting	
Homework	25%
Exams	20%

Implementation Project	30%
Research Project	25%

AsULearn rounds your grade and **that rounding will be final.**

Assignment details

Homework assignments, including quizzes and reading reflections, will be due throughout the semester. Exams will be shorter, take-home exams given at several times during the semester, after the completion of a significant collection of material. Deliverables for both the implementation and research projects will be due throughout the semester, while both projects will be presented at the end (either in-class or by recorded video). More details about all assignments will be posted on AsULearn.

General course policies

Office Hours

I will hold office hours in-person. If I am with another student, please be patient and respectful to the other student by waiting your turn. There may be times throughout the semester when I must cancel or reschedule my office hours due to last minute meetings or appointments. I will make sure to announce these changes. If you cannot attend my scheduled office hours, you may email me for an appointment. You are always welcome to ask questions over email. Please be patient with me because it may take me more than 60 minutes to respond. I may not immediately answer emails sent after 5pm on weekdays or sent at any time on weekends.

Public Labs

Anne Belk Hall, Rooms 309 and 311, are available to all Computer Science majors outside of scheduled class times and during normal building hours.

Attendance Policy

It is the policy of Appalachian State University that class attendance is an important part of a student's educational experience. Students are expected to attend every meeting of their classes. However, I do understand that life happens. Attendance will be taken every lecture period by means of each student writing their name on an attendance sheet before leaving class. If you do not write your name on the attendance sheet, then you will be marked absent. There is no grade penalty for being absent **except** on days where we are doing activities in class that cannot be completed outside of class. I will announce these days in advance, and you will lose credit for those activities unless you have an excused absence (see below). I will not be recording our classes, and materials will not necessarily be posted to the course page. It is up to you to attend lecture and take notes. If you are absent, I suggest asking a friend for their notes or attending my office hours.

For information about excused absences, see the University policies on attendance [here](https://academicaffairs.appstate.edu/sites/academicaffairs.appstate.edu/files/printable_pdf_of_the_attendance_policy.pdf) (https://academicaffairs.appstate.edu/sites/academicaffairs.appstate.edu/files/printable_pdf_of_the_attendance_policy.pdf). Beyond the situations mentioned there, I allow excused absences for school related activities (e.g., you may have to be gone because you are traveling for a school club) and being sick enough to go to the doctor (if in doubt, contact me and stay home). Another reason an absence may be excused is if the absence is discussed with me before the absence is to occur. Other reasons could be anything deemed beneficial to student learning. Again, please be proactive and contact me in advance if possible.

Attention and Participation

You must be an agent in your learning experience by attending lecture and paying attention. Lecture materials will not necessarily be posted to the course AsULearn page, and we will be doing many different activities (such as working through challenge activities from our textbook) in class. You will also need to keep up with the reading and other activities, which are important to learning the material well. Please be sure to attend lecture.

Email and Communications

I assume that students check their ASU email several times daily. If you check a different email address more frequently than your ASU address, then set your AppalNet account so that your email gets forwarded. I will hold you responsible for all information conveyed to you through email from me. Any updates will be posted to the AsULearn Announcements forum. When an announcement is posted on AsULearn, you should also receive an email. Again, I expect you to check your official campus email with some regularity. However, if I inform you in class that an assignment will be posted, I expect you to check for that assignment online even without an email. Assignments will appear on the calendar on the course AsULearn page as well as being listed in the week it was assigned. I will announce assignments in lecture as well. Please check the Announcements regularly in the event that you are not receiving emails sent from the course AsULearn page. Please use proper email etiquette when emailing me (or any professor). Use your official AppState email and include your course number or the name of the course (just

"Advanced SE" is fine) in the subject line. As I am getting to know everyone in the beginning of the semester, I ask that you are sure to introduce yourself in every email. Please be respectful in your emails. I will not respond to emails that I feel are rude or lack proper etiquette. If you are unsure of how to write an email to a professor please use the template below.

Hello Professor Hills,

My name is {first name last name} and I am in your Advanced SE course. {insert question or comment here}

Thank you,

{first name last name}

Academic Integrity Violations

Violations of the academic integrity policy can result in various sanctions. You can learn more about the policy on the university [Academic Integrity page \(https://academicintegrity.appstate.edu/\)](https://academicintegrity.appstate.edu/). If you are not sure if something you are doing would violate the policy (e.g., incorporating code from StackOverflow into your or your team's codebase, using code provided by tools such as GitHub Copilot or ChatGPT), please ask.

Class Cancellations

The university will send out an email should classes be cancelled for adverse weather. If I need to cancel class for any reason, I will notify you via email.

Special Days

Please reference the registrar's official 2024-2025 academic calendar for special days for the semester. Be aware of Add/Drop days and final exam periods. You can find the academic calendar [here \(https://registrar.appstate.edu/sites/default/files/2024-2025_academic_calendar.pdf\)](https://registrar.appstate.edu/sites/default/files/2024-2025_academic_calendar.pdf). You can find the final exam schedule [here \(https://registrar.appstate.edu/sites/default/files/app_state_fall_2024_exam_schedule_final_1.pdf\)](https://registrar.appstate.edu/sites/default/files/app_state_fall_2024_exam_schedule_final_1.pdf).

Appalachian State University Policies and Statements

Appalachian State University has policies and statements including the academic integrity code, disability resources (accommodations for students with disabilities), attendance, and student engagement with courses. You can find the current version of these policies and statements on the [Academic Affairs Syllabi Policy and Statement Information page \(https://academicaffairs.appstate.edu/resources-forms/syllabi-policy-and-statement-information\)](https://academicaffairs.appstate.edu/resources-forms/syllabi-policy-and-statement-information).

Public Sharing of Course Materials

All course materials, including video, may be subject to intellectual property protections under applicable law and regulation and are for the sole use of students enrolled in this class. Students do not have permission to copy or record materials except for personal use in the context of this class and students do not have permission to share any class materials, including videos, in any manner on any platform without the prior express permission of the faculty member teaching this course.

Withdraw dates

Withdraw no academic penalty: Friday, January 17, 2025

Withdraw using a career drop: Monday, March 24, 2025

[Learn more about how to withdraw in the Withdrawal Policy \(https://registrar.appstate.edu/resources/policies/academic-policies/withdrawal-policy\)](https://registrar.appstate.edu/resources/policies/academic-policies/withdrawal-policy).

[Syllabi Policy and Statement Information \(https://academicaffairs.appstate.edu/resources-forms/syllabi-policy-and-statement-information\)](https://academicaffairs.appstate.edu/resources-forms/syllabi-policy-and-statement-information)

[Additional Syllabi Policy and Statement Information \(https://academicaffairs.appstate.edu/resources-forms/optional-syllabi-policy-and-statement-information\)](https://academicaffairs.appstate.edu/resources-forms/optional-syllabi-policy-and-statement-information)