

Advanced Software Engineering (CSE870)

Spring 2025

Exam 1: Feb. 19 (in-person); Exam 2: April 23 (in-person)

Instructor: Dr. B. Cheng, online, chengb@msu.edu

Class: M, W: 10:20-11:40 am,

Office Hours: M, W: immediately after class or by appointment

Class Web Page: <http://www.cse.msu.edu/~cse870> (check regularly for announcements)

Reference Texts:

- Design Patterns: Elements of Reusable Object-Oriented Software, E. Gamma, R. Helm, R. Johnson, and J. Vlissides, 1995, Addison-Wesley.
- Numerous articles from the literature.

General Grading Guidelines:

Exams (2)	=	60%
In-class participation; Homework and Design Exercises	=	15%
Miniproject(s)	=	25%

Course objectives:

This course is designed to present students with an overview of advanced topics in *Software Engineering*. Students will be exposed to techniques that are gaining increasing attention in the industrial and research communities. Students will apply the software engineering techniques to homework assignments and mini-projects throughout the course. Both individual- and group-oriented exercises will be assigned. Class participation is an essential component of the course. Students will have opportunities to develop and/or improve their technical writing and software development skills during the course.

Tentative List of Topics to be covered:

- Software Process
- Requirements Engineering
- Model-driven engineering
- Design strategies
- Design Patterns
- Search-based Software Engineering
- Security
- Testing techniques
- Cybersecurity
- Autonomous Systems

CSE870 Course Administration

Requirements: Students should be familiar with at least two higher level languages, the foundations of computing, and the basic concepts of software engineering, including software process, requirements analysis, design, coding, and testing.

Integrity and Ethics:

- “*Academic dishonesty* at Michigan State University is defined by the General Student Regulations as conduct that violates the fundamental principles of truth, honesty, and integrity. This could encompass everything from cheating on an exam, using another person’s work without proper attribution, using information from other sources and representing it as your own (e.g., Chegg, AI-based systems, ChatGPT, Grammarly, etc), or collaborating with other students on an assignment without an instructor’s permission.” (ombud.msu.edu/resources-self-help/academic-integrity/what-is).
- Student Rights and Responsibilities (SRR) states that “The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards.”
- In addition, the CSE870 adheres to the policies on academic honesty as specified in reg.msu.edu/academicprograms/:

Protection of Scholarship and Grades General Student Regulations 1.0; the all-University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. (See Spartan Life: Student Handbook and Resource Guide and/or the MSU Web site: www.msu.edu.)

- Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, project work, quizzes, and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may NOT submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use Chegg, the website <http://www.allmsu.com>, LLMs (e.g., ChatGPT, Bard, and other AI-based tools, etc.) to complete any course work in CSE870. Please note that many web-based search engines now use AI technology to generate and “summarize” search results. Those results may not be directly used for course assignments; note that the results may contain invalid information (students should follow the references provided by the search results and read the original sources of the information to support their literature research). Students who violate academic dishonesty rules as stated here may receive a penalty grade, including—but not limited to—a failing grade on the assignment and/or in the course. Contact your instructor if you are unsure about the appropriateness of your course work. (See also <https://ombud.msu.edu/university-policies-guidelines>.)

- Additional Resources regarding Academic Integrity:
 - Spartan Experiences: General Student Regulations covering Academic Integrity
<https://spartanexperiences.msu.edu/about/handbook/regulations/general-student-r.html>
 - Ombudsman Site regarding Academic Integrity:
ombud.msu.edu/resources-self-help/academic-integrity/what-is

Disruptive Behavior: Article 2: Academic Rights and Responsibilities for students at Michigan State University states that “The student’s behavior in the classroom shall be conducive to the teaching and learning process for all concerned.” (Disruptive behavior includes use of **cell phones, interactive sessions using laptops or other electronic devices**, etc.)

Netiquette Guide for Online Courses: The following link contains guidelines provided by the MSU College of Engineering for appropriate behavior when participating in an online class and associated activities. Deviations to these guidelines may be considered disruptive behavior and will be handled accordingly.
<https://www.cse.msu.edu/~cse435/Handouts/Admin/NetiquetteGuideOnlineClasses.pdf>

Examinations: Two exams will be given. One midterm (hour-long) exam and another hour-long exam during MSU final’s week for our class time. The exams will contain questions covering required reading, homework (including design exercises), and the lectures. Scores of less than 60% can be considered to be failing.

Make-up Exams: No make-up exams will be given except for documented illness or personal emergency. To be eligible for a make-up, you must notify the instructor or the department office prior to the time of the exam and provide documentation for the situation when arranging the make-up. A student not taking an exam will receive a grade of 0.

Mini-Project: Not turning in one of the deliverables for the mini-project on the due date may result in the student receiving a 0 for the project component of their respective grades.

Homework/Design Exercises: All assignments (homework, design exercises, and mini-project related assignments) are due at the beginning of class unless otherwise noted by the instructor. Late work is not accepted without prior approval.