

CS 5373 Syllabus - Fall 2022

Software Modeling and Architecture

CLASS: 2:00 pm – 3:20 pm, TTh

Instruction Method: Face to Face

INSTRUCTOR: Dr. Michael E. Shin

Classroom: IMSE 121

OFFICE: 311 Engineering Center

OFFICE HOURS: TTh 11:00 am – 12 pm or by Appointment

PHONE: (806) 834-7350

EMAIL: Michael.Shin@ttu.edu

Class Material: Blackboard

Course Textbook:

- Hassan Gomaa, “Software Modeling and Design: UML, Use cases, Patterns & Software Architectures” Cambridge, 2011.

Course Reference:

- Hassan Gomaa, “Designing Concurrent, Distributed, and Real-Time Applications with UML,” Addison-Wesley Object Technology Series, 2000.

Course Description:

- This course introduces the theory and practice for software development and covers software requirements and analysis, software architecture, and detailed design.

Course objectives: The purpose of this course is to cover theories, methods, and tools for the specification and design of software systems. Students who succeed in this course will:

- Understand the principles of software specification and design
- Be able to practice software specification and design
- Be able to model with the Unified Modeling Language (UML)

Key Topics:

- Requirements Specification
- Requirements Analysis
- Architectural Design
- Detailed Design

Course Prerequisites: Undergraduate software engineering course.

The successful student’s prior knowledge and skills should have competent procedural and object-oriented programming, introductory software engineering knowledge, and an understanding of data structures and algorithms.

Learning Outcomes & Assessment Methods: Students who have completed this course should have the ability to:

Objective	Outcomes	Assessment Methods
1. Solicit and specify software requirements	MSSE 1, 2, 3, 4, 5 MSCS 1, 2, 3, 4, 5 PhD 1, 2, 3, 4	Midterm, Project
2. Design and specify software architectures	MSSE 1, 2, 3, 4, 5 MSCS 1, 2, 3, 4, 5 PhD 1, 2, 3, 4	Final Exam, Project
3. Perform and specify detailed design	MSSE 1, 2, 3, 4, 5 MSCS 1, 2, 3, 4, 5 PhD 1, 2, 3, 4	Final Exam, Project

Mediasite Link for Distance Learning Students:

<https://engrmediacast.ttu.edu/Mediasite/Channel/ems-cs5373-d01-shin-fall-2022>

Grading Policy:

The final grade for this course is based on class practices, projects, and exams:

- Class Participation: 35% (Attendance: 10%; Class Practices: 25%)
 - Attendance:
 - The class attendance will be checked regularly.
 - Class Practices
 - We will have class practices to ensure that students understand the concepts of lectures.
 - The instructor will announce when the class has a class practice.
 - The instructor will bring small group practice assignments to classes.
 - Small groups (each with two students) will be made on the class practice day in class.
 - Make-up:
 - The instructor can give you make-up for class practices on an upcoming day just after missing class practices. You may get a 30% deduction for missing a class practice without justification, such as a doctor's office visit and TTU-sponsored official travel.
 - Distance Learners: (Attendance: 0%; Class Practices: 35%)
 - You will receive Class Practices from TA by email and need to return them to TA by midnight.
- Project: 30%
 - Group-based project:
 - The instructor will give you a team-based project with its description.
 - We will organize the project teams in the class, each of which will have four members. You can choose your team members first, and then the instructor will reorganize the teams if a team does not have four members.
 - Distance Learners: Each distance student will be randomly allocated to a Lubbock students' group.

- Cross Evaluation
 - A member will evaluate the other members' project contributions in a team at the end of the project.
 - The instructor will provide a template to assess your team members.
 - Your final project grade is a portion of your contribution to the team project grade.
- Exam 35% (Exam1: 10%, exam2: 10%, Final Exam: 15%)
 - Exam dates:
 - Exam 1: 9/27/2022, Tuesday
 - Exam 2: 10/27/2022, Thursday
 - Exam 3: 11/29/2022, Tuesday
 - Make-up:
 - The instructor can give you make-up for exams on an upcoming day just after missing exams. You may get a 30% deduction for missing an exam without justification, such as a doctor's office visit and TTU-sponsored official travel.
 - Distance Learners:
 - You will receive exams from TA by email and return them to TA by a defined time.
- When you visit a doctor's office, you must inform the instructor immediately on the same day and submit a doctor's excuse note.
- The usual grading scale is **A (90-100), B (80-89), C (70-79), D (60-69), and F (0-59)**.
 - This scale may be subject to class performance.
- You are responsible for attending the class and checking the blackboard regularly to get any announcements.
- Beyond the conditions described above, the instructor will make all decisions.

Course Schedule: The following table describes the class schedule. **The schedule is tentative.** All changes will be announced in class or on the blackboard.

Week	Activity	Material
1: 8/25	Lecture	Syllabus
2: 8/30, 9/1	Lecture	Introduction
3: 9/6, 9/8	Lecture	Use case modeling (CP1)
4: 9/13, 9/15	Lecture	Static modeling
5: 9/20, 9/22	Job Fair, Review-Exam1, Lecture	Object structuring (CP2)
6: 9/27, 9/29	Exam1, No Class (9/29 Instructor Out of town)	
7: 10/4, 10/6	Lecture	Finite State machine (CP3)
8: 10/11, 10/13	Lecture	Dynamic model (CP4)

9: 10/18, 10/20	Review-Exam2, Lecture	Software Architecture
10: 10/25, 10/27	Lecture, Exam2	Software Architectural Design (CP5)
11: 11/1, 11/3	Lecture	Task Structuring (CP6)
12: 11/8, 11/10	Lecture	Class Design (CP7)
13: 11/15, 11/17	Review-Exam3, Lecture	Detailed Design
14: 11/22, 11/24	Thanksgiving Day	Project Discussion
15: 11/29, 12/1	Exam3, Lecture	Project Wrap Up
16: 12/6	Lecture	Class Wrap Up

Student Name and Gender Identity. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me accordingly early in the semester so that I may make appropriate changes to my records.

Inclusive Language. You are expected to treat your instructor and all other participants in the course with courtesy and respect. Your comments to others should be factual, constructive, and free from harassing statements. You are encouraged to disagree with other students, but such disagreements must be based on facts and documentation (rather than prejudices and personalities). The instructor aims to promote an atmosphere of mutual respect in the classroom. It is preferable if students discuss issues directly with the instructor. Please get in touch with the instructor if you have suggestions for improving the classroom environment.

Religious Holy Day Statement: "Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who intends to observe a religious holy day should make that intention known in writing to the instructor before the absence. A student excused under section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Discrimination, Harassment, and Sexual Violence Statement: Texas Tech University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from gender and sex discrimination. The University does not tolerate sexual assault, discrimination, harassment, and other Title IX violations. Report any incidents to the Office for Student Rights & Resolution (806)-742-SAFE (7233) or file a report online at

titleix.ttu.edu/students. Faculty and staff members at TTU are committed to connecting you to resources on campus. Some of these available resources are: TTU Student Counseling Center, 806-742-3674, <https://www.depts.ttu.edu/scc/> (Which provides confidential support on campus.) TTU 24-hour Crisis Helpline, 806-742-5555, (Assists students who are experiencing a mental health or interpersonal violence crisis. If you call the helpline, you will speak with a mental health counselor.) Voice of Hope Lubbock Rape Crisis Center, 806-763-7273, voiceofhopelubbock.org (24-hour hotline that provides support for survivors of sexual violence.) The Risk, Intervention, Safety, and Education (RISE) Office, 806-742-2110, <https://www.depts.ttu.edu/rise/> (Provides a range of resources and support options focused on prevention education and student wellness.) Texas Tech Police Department, 806-742-3931, <http://www.depts.ttu.edu/ttpd/> (To report criminal activity that occurs on or near Texas Tech campus.)

LGBTQIA Support Statement*: I identify as an ally to the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) community, and I am available to listen to and support you in an affirming manner. I can assist in connecting you with resources on campus to address problems you may face about sexual orientation and gender identity that could interfere with your success at Texas Tech. Additional resources are available through the Office of LGBTQIA within the Center for Campus Life, Student Union Building Room 201, www.lgbtqia.ttu.edu, 806.742.5433.

Office of LGBTQIA, Student Union Building Room 201, www.lgbtqia.ttu.edu, 806.742.5433. Within the Center for Campus Life, the office serves the Texas Tech community through facilitation and leadership of programming and advocacy efforts. This work aims to strengthen the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) community and sustain an inclusive campus that welcomes people of all sexual orientations, gender identities, and gender expressions.

Ethical Conduct: Although students are encouraged to discuss ideas and problems with the TA, instructor, and other students, academic dishonesty will not be tolerated. Unless stated otherwise by the instructor, you are not allowed to share code or answers, use or even look at code or answers from online sources, friends, or classmates. It is your responsibility to educate yourself about actions that constitute academic dishonesty. If you are unsure whether a specific action is allowed, talk to the instructor and the TA before indulging in it. All submitted code and assignments will be randomly checked for plagiarism. If discovered, academic dishonesty of any kind will result in one or more of the following sanctions: a grade of 0 for the corresponding graded item, a grade of “F” in the course, and further action according to the TTU operating procedures: <http://www.depts.ttu.edu/opmanual/OP34.12.pdf>.

- Cheating will not be tolerated on any work done throughout the semester.
- The first offense will result in an F for that assignment, and the second offense will result in an F in the course. Both offenses must be reported to Student Judicial Programs.
- Cheating is considered to be any collaboration beyond essential discussion for anything unless announced explicitly by the instructor. See Statement of

Academic Conduct for Engineering Students, College of Engineering, for further information.

- “Students are expected to assist in maintaining a classroom environment that is conducive to learning. To assure that all students have the opportunity to gain from time spent in class unless otherwise approved by the instructor, students are prohibited from engaging in any form of distraction. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.”

A student with Disabilities: Any student who, because of a disability, may require special arrangements to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, contact the Student Disability Services office at 335 West Hall or 806-742-2405.

Civility in the Classroom Statement: Texas Tech University is a community of faculty, students, and staff that enjoys an expectation of cooperation, professionalism, and civility during the conduct of all forms of university business, including the conduct of student-student and student-faculty interactions in and out of the classroom. Further, the classroom is where an exchange of ideas and creative thinking should be encouraged, and intellectual growth and development should be fostered. Students who disrupt this classroom mission with rude, sarcastic, threatening, abusive, or obscene language and behavior will be subject to appropriate sanctions according to university policy. Likewise, faculty members are expected to maintain the highest standards of professionalism in all interactions with all constituents of the University (www.depts.ttu.edu/ethics/matadorchallenge/ethicalprinciples.php).

Center for Campus Life: The Center for Campus Life can assist in notifying the campus community of student illnesses, immediate family deaths, and student death. Generally, in cases of student illness or immediate family deaths, the notification to the appropriate campus community members occurs when a student is absent from class for four consecutive days with appropriate verification. The student is responsible for missed class assignments and course work during their absence.

INSTITUTIONALLY REQUIRED INFORMATION TO INCLUDE IN ALL SYLLABI:

ADA STATEMENT:

Any student who, because of a disability, may require special arrangements to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note: instructors are not allowed to provide classroom accommodations to a student until appropriate

verification from Student Disability Services has been provided. Please get in touch with Student Disability Services in West Hall for additional information or call 806-742-2405.

ACADEMIC INTEGRITY STATEMENT:

Academic integrity is taking responsibility for one's class and course work, being individually accountable, and demonstrating intellectual honesty and ethical behavior. Academic integrity is a personal choice to abide by intellectual honesty and responsibility standards. Because education is a shared effort to achieve learning through exchanging ideas, students, faculty, and staff have the collective responsibility to build mutual trust and respect. Ethical behavior and independent thought are essential for the highest level of academic achievement, which then must be measured. Academic achievement includes scholarship, teaching, and learning, all shared endeavors. Grades are a device used to quantify the successful accumulation of knowledge through learning. Adhering to the standards of academic integrity ensures grades are earned honestly. Academic integrity is the foundation upon which students, faculty, and staff build their educational and professional careers. [Texas Tech University ("University") Quality Enhancement Plan, Academic Integrity Task Force, 2010]

RELIGIOUS HOLY DAY STATEMENT:

"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known in writing to the instructor before the absence. A student absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student excused under section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

COVID related items

Vaccinations: Texas Tech University strongly recommends students adhere to CDC guidelines on COVID-19, including obtaining COVID-19 vaccinations. If you could not obtain a vaccination before your arrival on campus, the COVID-19 vaccine is available at Student Health Services by appointment. [You can find additional information about the vaccine and campus vaccine clinics here.](#)

Face Covering Policy: As of May 19, 2021, face coverings are optional in TTU facilities and classrooms but, based on CDC guidelines, are recommended and welcome, especially for those who have not been vaccinated for COVID-19 or who may have susceptibilities to the virus. Face coverings are required in public transportation (e.g., Citibus) and in the Student Health Clinic.

Illness-related Absences: Illness-related absences will require proper documentation in order to be considered an excused absence. It is the student's responsibility to communicate with the course instructor regarding adjusting course deadlines (HW, exams, etc.), due to illness, in advance of those deadlines. The instructor will work with students with documented illnesses regarding missed work or deadlines. For further information please reference the COVID-19 page (<https://www.depts.ttu.edu/communications/emergency/coronavirus/>).

In-Person Office Hours: The instructor will hold face-to-face office hours. Masks are recommended for students attending office hours.

Personal Hygiene: We should continue to practice frequent hand washing, use hand sanitizers after touching high-touch points (e.g., door handles, shared keyboards, etc.), and cover faces when coughing or sneezing.

Potential Changes: The University will continue to monitor CDC, State, and TTU System guidelines to manage the campus implications of COVID-19. Any changes affecting class policies or delivery modality will be announced by those guidelines as soon as possible. Suppose Texas Tech University campus operations or activities in this class are required to change because of health concerns related to the COVID-19 pandemic. In that case, this course may move to a fully online delivery format. Should that be necessary, students will need to have a computer that meets the laptop requirements of the Whitacre College of Engineering found at <https://www.depts.ttu.edu/coe/dean/engineeringitservices/buyingtherightcomputer.php>, webcam, and microphone to participate in class and conduct exams. Students will have to scan and submit course assignments as required and specified for the class.

In the event of a change to an online teaching modality, online exams and quizzes within this course may require online proctoring. Therefore, students must have a webcam (USB or internal) with a microphone when taking an exam or quiz. Students understand that this remote recording device is purchased and controlled by the student and that recordings from any private residence must be done with the permission of any person in residence. To avoid any concerns in this regard, students should select private spaces for the testing. The University library and other academic sites offer secure private settings for recordings. Students with concerns may discuss the location of the appropriate recording space with their instructor or advisor. Students must ensure that recordings do not invade any third-party privacy rights and accept all responsibility and liability for violations of any third-party privacy concerns. Setup information will be provided before taking the proctored exam.

All students must review the syllabus and the requirements, including the possible online terms and equipment requirements, to determine if they wish to remain in the course. Enrollment in the course is an agreement to abide by and accept all terms. Any student may elect to drop or withdraw from this course before the end of the drop/add period.

Additional COVID-related information and TTU COVID updates can be found at
<https://www.depts.ttu.edu/communications/emergency/coronavirus/>