

CS 5385 Software Requirements

Master of Science in Software Engineering (MSSwE)

Course Description

This course facilitates the discussion of key Software Engineering (SWE) and Requirements Engineering concepts, processes, and activities performed by software engineers. The course addresses what Software Engineering is about as well as its reference domains, types of lifecycles, and major authoritative sources. The course addresses the major activities of requirements engineering, customer and technical requirements, Operational Concept document, prototyping, software requirements specification, verification and validation of software requirements, support tools for requirements engineering including requirements traceability. Finally, the ethical aspects to be considered when writing software requirements specifications and soft skills to interview and present technical work are reviewed.

Course Goal

The course goal is to prepare students to become proficient in applying software requirements engineering methods and techniques, working in cooperative teams, and managing projects. This course is also designed to promote your overall success, inside and outside the classroom. The coursework helps you to improve in key areas such as Communication, Confidence, Critical Thinking, Leadership, Problem Solving, Social Responsibility, and Teamwork. To find out more about the university's plan to improve student engagement and learning, visit the UTEP Edge.

Contact Information	
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<i>Remote class</i>	<i>Wednesday 6:00 tp 8:45 PM @ Blackboard Collaborate</i>
<i>Remote office hours</i>	Monday 9:45 am to 10:30 am; Tuesday 5:40 to 6:30 pm On Blackboard Collaborate

Personal enquiries should be done through e-mail messages. Course enquiries should be done through the Class Discussion Board by creating a new thread.

Required Readings Material

You will need the following reading materials throughout this course:

- Bourque, P. and Fairly, R. (2014). *Guide to the Software Engineering Body of Knowledge (SWEBOOK) V3.0*. IEEE Computer Society. Retrieved from <https://ieeecs-media.computer.org/media/education/swebok/swebok-v3.pdf>
- ISO/IEC/IEEE (2018). *Systems and software engineering — Life cycle processes — Requirements engineering* (Standard 29148 (E)). IEEE. Retrieved from <https://0-ieeeexplore-ieee-org.lib.utep.edu/stampPDF/getPDF.jsp?tp=&arnumber=8559686&ref=aHR0cHM6Ly9saWludXRlcC5lZHUvd2FtdmFsaWRhdGU/dXJsPWwh0dHBzJTNBjTJGJTJGMC1pZWVleHBsb3JlLWlZZWUtb3JnLmVkbWVkdSUzQTQ0MyUyRnN0YW1wJTJGc3RhbXUANwJTNGdHAIMQIMjZhc51bWJlciUzRDg1NTk2ODY=&tag=1>
- ISO/IEC/IEEE (2015). *Systems and software engineering — Systems Life cycle processes — Requirements engineering* (Standard 15288 (E)). IEEE. Retrieved from <https://0-ieeeexplore-ieee-org.lib.utep.edu/stamp/stamp.jsp?tp=&arnumber=7106435>

- CMMI Product Team. (2010). *CMMI for Development. Version 1.3*. CMMI Institute. There is a link in BB to download this resource.
- International Council on Systems Engineering. (2015). *INCOSE systems engineering handbook: A guide for system life cycle processes and activities*. Fourth edition. Eds. Forsberg, K. Roedler, G., Walden, D. et. al. Hoboken, NJ: Wiley.
Note: UTEP is an INCOSE Corporate Advisory Board (CAB) member. You can get a free Associate Member/Student Account [here](#)..

see the “Readings” section for the readings assigned in each discussion board, individual assignment or group assignment.

Summary of Course Structure

Content is provided in modules that are released every two weeks. Each module will have a menu to guide students through the content and identify discussion board postings and/or individual and group assignments to be completed on Blackboard’s course shell. The first module provides course overview, facilitates attendee’s introductions, and discusses Software Engineering, lifecycles, and requirements engineering main concepts. The modules for this course are as follow:

#	Module Name
1	Lifecycles and TSP principles for Teamwork
2	Problem scope, assuring quality, and customer needs
3	Customer Requirements and Requirements Traceability
4	Customer Requirements Validation & Config. Management & Decision Analysis
5	Software Requirement Specification and Analysis views
6	Refining requirements & Class diagram and Sequence diagram
7	Analyzing Behavior & Managing requirements in Agile
8	Refining Prototype and Final Presentation

Being Successful Remotely

This section has some tips and trick about how to be successful in your remote class. Online learning is not a spectator sport. It is everyone's responsibility to participate as much as they can so everyone can get the most from the experience. Here are some simple rules to follow to ensure your participation and engagement in the learning process:

- Ask questions: If you don't know the answer, someone else will. The discussion board is the area for asking questions related to content OR any problems (related to the class) you are having. Make sure that you have clearly indicated the subject of your message.
- Reach out to others: Offer a fact, article, link, or other item that can help others learn.
- Be appropriate: The remote classroom is not the place for insulting or insensitive comments, attacks, or venting. Inappropriate behavior can be subject to disciplinary action.
- Be diplomatic: When sending messages on emotionally charged topics, I recommend that you write the message and then walk away for at least an hour before re-reading the message and then sending it. Re-reading emotionally charged messages ensures that they are constructive instead of destructive. Think of the person on the other end.
- Stay focused: Stay on topic to increase the efficiency of your learning.

Grading Criteria

The following scale is used for assigning letter grades.

A	[90 % and above]
B	[80 % - 89 %]
C	[70 % - 79%]
D	[60 % - 69 %]
F	[0 % - 59%]

Note that there will be no “rounding up” automatically but the instructor does reserve the right to lower the grade scale if it is deemed appropriate.

Point Distribution

15	Discussion
10	Individual Assignment
45	Group Assignment (Project work)
10	Assessment of team feedback & Instructor evaluation
20	Module exams

Assignments. No late homework will be accepted.

Problems that have been assigned as individual work can be discussed with other students in a general way, but the solutions must be done independently and the work must be unmistakably your own. Assignments completed as a team, must include all student names on the first sheet. By signing your name, you are stating that you agree with the answers and can explain them to the TA or instructor. Students are expected to read assigned sections of the book and to be prepared to discuss the material in class. Quizzes will be given at the start of the class to check for general understanding of the material.

Project. Each deliverable of the project is graded independently. Please be pro-active in asking questions about the deliverables and comments by the guidance team.

Each team member is responsible for **documenting his/her work on the project** in the weekly schedule. The percentage of the project grade calculated towards the final course grade is determined through this documentation and the individual's contribution toward creating an effective team environment. **No late project work will be accepted.**

Exams. No make-up exams.

Participation: You must have an active participation in the class forum, customer forum, group assignments, and synchronous blackboard sessions. Your participation is assessed by your team members and by your instructor and it is part of your grade.

TECHNOLOGY REQUIREMENTS

Course content is delivered via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have access to a computer/laptop, scanner, a webcam, and a microphone. You will need to download or update the following software: Microsoft Office, Adobe Acrobat Reader, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course.

If you do not have a word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about [Microsoft Office 365](#) and follow the instructions.

IMPORTANT: If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP [Help Desk](#) as they are trained specifically in assisting with technological needs of students. **Please do not contact me for this type of assistance.** The Help Desk is much better equipped than I am to assist you!

Course Communication: *How we will stay in contact with each other*

Because this is a remote class, we won't see each other in the ways you may be accustomed to: during class time, small group meetings, and office hours. However, there are a number of ways we can keep the communication channels open:

- **Office Hours:** We will not be able to meet on campus, but I will still have office hours for your questions and comments about the course. My office hours will be held on Blackboard Collaborate (see the link in left menu of your BB course) during the following times:
 - Mondays: 9:45 to 10:30 am
 - Tuesdays: 5:40 to 6:30 pm. Mountain Time
- **Email:** UTEP e-mail is the best way to contact me. I will make every attempt to respond to your e-mail within 24-48 hours of receipt. When e-mailing me, be sure to email from your UTEP student account and please put the course number in the subject line. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name, and your university identification number.
- **Discussion Board:** If you have a question that you believe other students may also have, please post it in the Help Board of the discussion boards inside of Blackboard. Please respond to other students' questions if you have a helpful response.
- **Announcements:** Check the Blackboard announcements and the class forum frequently for any updates, deadlines, or other important messages.

NETIQUETTE

As we know, sometimes communication online can be challenging. It's possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- **Always consider audience.** This is a graduate-level course; therefore, all communication should reflect polite consideration of other's ideas.
- **Respect and courtesy** must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated.
- **When reacting to someone else's message,** address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- **Blackboard is not a public internet venue;** all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.

Course Policies:

What do you need to do to be successful in the course?

ATTENDANCE AND PARTICIPATION

Attendance in the course is determined by participation in the learning activities of the course. Your participation in the course is important not only for your learning and success but also to create a community of learners. Participation is determined by completion of the following activities:

- Reading/Viewing all course materials to ensure understanding of assignment requirements
- Participating in engaging discussion with your peers on the discussion boards (grading rubric provided in the “grading information” area of each forum)
- Active Participation in scheduled Blackboard Collaborate sessions (synchronous remote sessions)
- Other activities as indicated in the weekly modules

Because these activities are designed to contribute to your learning each week, they cannot be made up after their due date has passed.

EXCUSED ABSENCES AND/OR COURSE DROP POLICY

According to UTEP Curriculum and Classroom Policies, “When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with a grade of “W” before the course drop deadline and with a grade of “F” after the course drop deadline.” See academic regulations in the UTEP Undergraduate Catalog for a list of excuse absences. Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will drop you from the course. I will provide 24 hours advance notice via email.

BLACKBOARD SYNCHRONOUS COLLABORATE SESSIONS

This class requires that you participate in scheduled Synchronous Blackboard Collaborate sessions. The purpose of these sessions is for you to view live demonstrations of the course material and/or to participate in small discussion groups with your classmates. These sessions will be held Mondays from 6:00 to 8:45 pm.

Students are expected to have an **active participation** in these sessions with a webcam and microphone. The sessions will be recorded and provided so that they can be reviewed by classmates at a later time. Students should not record the sessions and post them to any sites outside of Blackboard.

If you are unable to attend a Collaborate session, please let me know as soon as possible so that accommodations can be made when appropriate.

DEADLINES, LATE WORK, AND ABSENCE POLICY

Major Project Assignments

- Major project assignments will be due on Sundays at midnight (11:59 PM). No late work will be accepted if the reason is not considered excusable.

Discussion Board Assignments & Module Exams

- Discussion Board Assignments require a initial post due on Tuesdays at 11:59 pm MST and two peer review technical feedbacks on Thursday. You must provide reference name and pg # in both initial post and peer reviews.
- Module exams will be due on Sundays at midnight (11:59 PM). No late work will be accepted if the reason is not considered excusable.

MAKE-UP WORK

Make-up work will be given *only* in the case of a *documented* emergency. Note that make-up work may be in a different format than the original work, may require more intensive preparation, and may be graded with penalty points. If you miss an assignment and the reason is not considered excusable, you will receive a zero. It is therefore important to reach out to me—in advance if at all possible—and explain with proper documentation why you missed a given course requirement. Once a deadline has been established for make-up work, no further extensions or exceptions will be granted.

ALTERNATIVE MEANS OF SUBMITTING WORK IN CASE OF TECHNICAL ISSUES

I strongly suggest that you submit your work with plenty of time to spare in the event that you have a technical issue with the course website, network, and/or your computer. I also suggest you save all your work (answers to discussion points, quizzes, exams, and essays) in a separate Word document as a back-up. This way, you will have evidence that you completed the work and will not lose credit. If you are experiencing difficulties submitting your work through the course website, please contact the UTEP Help Desk. You can email me your back-up document as a last resort.

INCOMPLETE GRADE POLICY

Incomplete grades may be requested only in exceptional circumstances after you have completed at least half of the course requirements. Talk to me immediately if you believe an incomplete is warranted. If granted, we will establish a contract of work to be completed with deadlines.

ACCOMMODATIONS POLICY

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the [UTEP Center for Accommodations and Support Services](#) (CASS).

Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at cass@utep.edu, or apply for accommodations online via the [CASS portal](#).

COVID-19 Accommodations

Students are not permitted on campus when they have a positive COVID-19 test, exposure or symptoms. If you are not permitted on campus, you should contact me as soon as possible so we can arrange necessary and appropriate accommodations.

(classes with on-campus meetings) Students who are considered high risk according to CDC guidelines and/or those who live with individuals who are considered high risk may contact [Center for Accommodations and Support Services](#) (CASS) to discuss temporary accommodations for on-campus courses and activities.

SCHOLASTIC INTEGRITY

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more, please visit [HOOP: Student Conduct and Discipline](#).

CLASS RECORDINGS

The use of recordings will enable you to have access to class lectures, group discussions, and so on in the event you miss a synchronous or in-person class meeting due to illness or other extenuating circumstance. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA) and UTEP's acceptable-use policy. A recording of class sessions will be kept and stored by UTEP, in accordance with FERPA and UTEP policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. **You may not share recordings outside of this course.** Doing so may result in disciplinary action.

TEST PROCTORING SOFTWARE

Two course assessments (module exams) will make use of Respondus Lock Down Browser and Respondus Monitor inside of Blackboard to promote academic integrity. You are encouraged to learn more about how to use these programs prior to the first test.

Please review the following guidelines:

- The assessments will only be available at the times identified on the course calendar.
- You may take the test during the 24-hour window.
- A reliable Internet connection is essential to completing the exam. If you must go to a location to take the exam (such as the library), be sure to follow their health and safety requirements.
- You only have ONE attempt to take the test. You shall not take it multiple times. Only the first attempt is recorded.
Note: if there is technical problem and you are kickout from the exam, then you should retake the exam again from the start. A log of the technical issue is recorded by BB.
- Respondus Lockdown Browser will require that all internet tabs are closed prior to the start of the test.
- Respondus Monitor requires a webcam and microphone.
- You will be required to show the webcam your student ID prior to the start of the test.
- Your face should be completely visible during the test. Blocking the camera will disable the test.
- No notes or textbook materials are permitted during the test. Respondus Monitor requires you to take a video of your surrounding area (desk, chair, walls, etc.)

- You should not have conversations with other people and/or leave and return to the area during the test.

PLAGIARISM DETECTING SOFTWARE

Some of your course work and assessments may be submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used to review assignment submissions for originality and will help you learn how to properly attribute sources rather than paraphrase.

COPYRIGHT STATEMENT FOR COURSE MATERIALS

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.

COVID-19 PRECAUTIONS

You must STAY AT HOME and REPORT if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at screening.utep.edu. If you know of anyone who should report any of these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to COVIDaction@utep.edu.

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website (screening.utep.edu) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection.

Wear face coverings when in common areas of campus or when others are present. You must wear a face covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom. If you remove your face covering, you will be asked to put it on or leave the classroom. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.

(classes with on-campus meetings) Please note that if COVID-19 conditions deteriorate in the City of El Paso, all course and lab activities may be transitioned to remote delivery.

Course Resources:

Where you can go for assistance

UTEP provides a variety of student services and support:

Technology Resources

- **Help Desk:** Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

Academic Resources

- **UTEP Library:** Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.

- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [History Tutoring Center \(HTC\)](#): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

Individual Resources

- [Military Student Success Center](#): Assists personnel in any branch of service to reach their educational goals.
- [Center for Accommodations and Support Services](#): Assists students with ADA-related accommodations for coursework, housing, and internships.
- [Counseling and Psychological Services](#): Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.

Important Dates.

Jan 19th	Spring classes begin
Jan 19th–22nd	Late Registration (Fees are incurred)
Feb 3rd	Spring Census Day
Feb 15th	20 th Class Day
Feb 19th	Graduation application deadline for degree conferral
Mar 21st	Midterm Spring 2021 Grades Due
Mar 15-19th	Spring Break
Mar 26th	Cesar Chavez Holiday – no classes
Apr 1st	Spring Drop/Withdrawal Deadline
Apr 2nd	Spring Study Day
Apr 16th	Deadline to submit candidates' names for degree conferral
May 6th	Spring – Last day of classes
May 7th	Dead day
May 10-14th	Spring Final Exams
May 15-16th	Spring Commencement
May 19th	Grades are Due
May 20th	Grades are posted to student records; students are notified of grades and academic standing

Learning Outcomes

Level 1. Knowledge and Comprehension

Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. The material has been presented only at a superficial level. Upon successful completion of this course, students will be able to:

- a. Define software engineering, software characteristics, reference disciplines of software (computing, Engr., Math & Statistics, social sciences and management sciences), concepts and principles (abstraction, anticipation of change, modularity, stepwise refinement, and separation of concerns).
- b. Define quality attributes such as availability, correctness, efficiency, interoperability, maintainability, portability, reliability, security, modifiability, availability, testability, and usability.
- c. Describe the structure and main purpose of authoritative sources for Software lifecycle processes, requirements engineering process, and Software Engineering (SWEBOK, CMMI, ISO/IEC/IEEE 15288 Std, ISO/IEC/ISO 29148, and INCOSE SE Handbook)
- d. Define security design principles and the rule of least astonishment.

Level 2: Application and Analysis

Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details. Upon successful completion of this course, students will be able to:

- a. Determine the main characteristics of a life cycle (stages, gates, processes, recursion, and iteration) and which life cycle model (waterfall, incremental, iterative, prototyping, RAD, Spiral, Agile) to use by analyzing project and business constraints.
- b. Apply techniques for eliciting requirements including interviews.
- c. Analyze requirements to determine if they meet the attributes of well-written requirements.
- d. Identify risks in software development and requirements engineering activities.
- e. Analyze the course project and determine the local and global impact on computing on individuals, organizations, and society, including consideration of professional software engineering code of ethics.
- f. Relate the importance of professional societies (e.g., ACM, IEEE-CS, CMMI, INCOSE).
- g. Engage in self-directed study to learn new techniques and tools for software requirements definition.

Level 3: Synthesis and Evaluation

Level 3 outcomes are those in which the student can apply the material in new situations. This is the highest level of mastery. Upon successful completion of this course, students will be able to:

- a. Construct a Software Operational Concept (OpsCon) document that provides an operational description of the system from the user's point of view.
- b. Conduct verification and validation using techniques such as inspections or walkthroughs following a review process with checklists and a defect log (e.g., Personal Software Process (PSP) review technique).
- c. Construct a prototype, which adheres to basic HCI principles and applicable security design principles, to validate the user interface.
- d. Construct a software requirements specification.
- e. Analyze and model aspects of a problem by applying various modeling techniques (e.g., Use cases, Context diagrams, OOA class diagrams, Requirements diagram, Data flow diagrams, state transition diagram, and interaction diagrams).
- f. Demonstrate an ability to assemble and orally present technical work and compose technical documents that are grammatically correct and technically sound.
- g. Apply effective techniques for project management, collaboration, and problem-solving by building a high-performance team (e.g., applying principles of Team Software Process (TSP) to build and congeal the team).