IE 5352: Requirements Engineering
Spring 2019

Instructor: Dr. Susan Ferreira
Office Number: Woolf Hall 420K
Office Telephone Number: 817-272-1332
Email Address: ferreira@uta.edu
Faculty Profile: https://mentis.uta.edu/explore/profile/susan-ferreira
Office Hours: Thursday 1-3 pm (other times by appointment)

Graduate Teaching Assistant Support: GTA hours will be listed on Blackboard once available.

Section Information: Information in this syllabus is relevant for IE 5352 Sections 001, 002, & 003
Time and Place of Class Meetings: Monday 4-6:50pm, Nedderman Hall 109

Description of Course Content: This course focuses on system requirements engineering and related processes including requirements elicitation, requirements analysis, requirements management, validation, and verification. Students will learn and apply requirements engineering process methods and use appropriate software support tools. Students will be introduced to model-based systems engineering using SysML related to the requirements processes covered in the class. Special topics (e.g., formal methods) will also be presented as time permits.

Student Learning Outcomes:
- Explain key concepts related to requirements engineering including associated processes and methods.
- Describe and apply processes, methods, techniques, and tools related to requirements elicitation, requirements analysis and modeling, requirements specification, requirements traceability and management, validation, and verification.
- Appropriately represent requirements in a requirements specification.
- Explain model-based systems engineering concepts and apply these to construct requirements engineering related system diagrams and models.
- Demonstrate the use of reference sources related to requirements engineering.

Required Textbooks and Other Course Materials:
Required Textbook:
- Laplante, P.A. (2017). *Requirements engineering for software and systems* (3rd ed.). Boca Raton, FL, USA: Taylor & Francis, CRC Press. ISBN-13: 978-1138196117.

Other Course References:
- International Council on Systems Engineering (INCOSE). (2015). INCOSE systems engineering handbook: a guide for system life cycle processes and activities (4th ed.). Hoboken, NJ, USA: John Wiley & Sons. ISBN-13: 978-1118999400.
- Government Electronics and Information Technology Association (GEIA). (1999). GEIA Standard (EIA-632), Processes for engineering a system. Arlington, VA, USA: GEIA. Available online at UTA: https://dcontent.uta.edu/1561405/EIA632-1999.pdf.
- Friedenthal, S., Moore, A. and Steiner, R. (2015). *A practical guide to SysML: the systems modeling language* (3rd ed). Morgan Kaufmann, The MK/OMG Press, Elsevier. ISBN-13: 978-0128002025. Available online at UTA library.
- ISO/IEC/IEEE. (2018). Systems and software engineering-life cycle processes-requirements engineering, Reference number ISO/IEC/IEEE 29128:2018(E). Available online at UTA: https://ieeexplore-ieee-org.ezproxy.uta.edu/stamp/stamp.jsp?tp=&arnumber=8559686.
- Federal Aviation Administration (FAA). (2006). *National airspace system, system engineering manual*, Version 3.1.
- Other reference information will be: (1) received as handouts, (2) identified as UTA library reserve readings, or (3) UTA library lookup and/or Internet accessible documents. Access to slides summarizing the lecture materials will be provided to students.

Course Website: Blackboard (elearn.uta.edu). Course presentations, syllabus, reading and homework assignments and other important documentation will be accessible via Blackboard. Presentation and other online materials may be password protected. If so, the instructor will provide the password to open the documents during class.

Descriptions of major assignments and examinations:
Assignments and Projects: Expect assignments to be due every 1-2 weeks. A final project will also be assigned. Team assignments and the final project require that a presentation be provided during the class. Assignment and project presentations must be made within the specified time requirements or the assignment or project will be penalized. For team assignments, one assignment is handed in per team. The electronic version of the presentation in Powerpoint format is due at least one day prior to the assignment/project deliverable due date and is to be emailed to the instructor and the teaching assistant. A hardcopy of the presentation of the assignment or project must be provided to the instructor prior to the presentation in class. For team assignments, **all team members** are responsible for being familiar with the content of the assignment responses. Team members will be individually selected by the instructor to give the presentation or answer questions at any point during the presentation. Multiple students may be selected to give the assignment presentation when it is due in class. In-class section students who are to present will not be identified in advance of the class. Distance students will be identified in advance of the class session the assignment is due in order to make appropriate arrangements for the presentation (see section below for distance students). If a student is selected and is not in class when called to present, the selected student will be penalized 10% of the assignment grade.

Assignment and project grades are based primarily on the content and quality of preparedness for presentations and question responses. Late assignments or projects will be penalized. If an assignment or project is not handed in prior to the class session that the assignment is due, no credit will be received for the assignment. All students are expected to present a portion of the final project presentations.

The class requires students to participate on a team of their class peers for assignments unless specified otherwise (e.g., individual assignments). This will require that the teams be capable of conducting face-to-face and/or virtual meetings outside the classroom. The instructor will identify the teams and associated members at the beginning of the semester. Each team member will be expected to prepare and present a final review of the accomplishments of its individual team members using a peer evaluation form at the end of the semester. Team members are required to establish ground rules at the beginning of the semester. If an individual assignment or project is required, the individual student is required to work on their own. Copying, including from past students' assignments and projects as well as from other current students or teams is not permitted and the university ethics policy will be followed if this occurs.

Quizzes may be performed in the class. If this is the case, an individual quiz or a set of quizzes may substitute for an assignment. There is no makeup for quizzes. However, the instructor may elect to drop the lowest grade for one of the quizzes.

In addition to the instructor presentation and discussion, assignment and project presentations, and quizzes, students should expect in-class exercises during the lecture time. These in-class exercises are intended to provide students with practice related to concepts prior to homework assignments.

Distance Section Student (Sections 002 & 003) Participation: Note that this is not a self-paced course. All distance students are expected to keep up with the course and coordinate with their team on a weekly basis and as required to support the assignments and projects. Distance section students will have the same due date & time for the assignments and projects as in-class section students. Distance students to provide presentations will be identified in advance in order to give sufficient time to make arrangements to present the requested assignment. For presentations, distance students will have the option of (1) being physically present during the class, (2) connecting into class with Blackboard Collaborate or Google Hangouts [coordinate with the instructor at least a day in advance for this option], or (3) preparing a video which can be shown in class when the assignment is due. The Industrial, Manufacturing, and Systems Engineering Department distance education policies will be followed with the exception that

what is in this syllabus takes precedence. Distance students must take exams the day prior or same day as in-class students.

Exams: There will be two exams, a midterm and final. Each exam is closed book. A 3"x5" paper with notes is allowed. If either of the dimensions is exceeded, the note paper will not be allowed. Any issues noted during or post examination may result in penalties including follow-through with the university ethics policy. The instructor will notify students in advance of an exam if a scantron form is required. If an exam is missed, no makeup will be allowed without prior permission from the instructor or an excuse approved by the instructor and with legitimate written documentation proving an illness or emergency. Additional information to verify the validity of your excuse may be requested. The student will receive a grade of zero for the exam without an approved excuse from the instructor. If an excuse is approved, the instructor will require the student to take a comprehensive exam at the end of the semester.

Exam Policies:
- **Before an exam: Students must bring their UTA ID card to all exams as the ID will be checked and matched to an exam.** There will be assigned seats for the exams. The instructor will provide a roster with seat locations and a seating chart. You must arrive by the time the class is scheduled to start. It is recommended that students be at the class 10 minutes before the exam starts to provide sufficient time to find your assigned seat and get settled. Each exam will be scheduled for the time identified by the instructor. You will not be given additional time if you are late to an exam.
- **During an exam:** All exams are closed book and closed notes unless noted otherwise by the instructor. Students are only allowed to use their pens, pencils, erasers, and any documentation provided by the instructor. Any attempt to use items on the exam not allowed by the instructor (e.g., cheating) will result in following the university ethics policy. Cellphones, computers, and other communication devices must be turned off and removed from the desk or table. All items not allowed for the exam should be placed on the floor. Students must work alone on exams. No sharing of any materials or communication with other students may occur during exams including writing instruments, etc. Please use the restroom prior to the exam. Any suspicious behavior during the exam will be noted by the proctor. In certain circumstances, students may be confronted by the proctor. Any problematic circumstances may result in penalties including following the university ethics policy. Exams are to be opened, started, and stopped at the times announced by the proctor. Anyone attempting to view an exam early or stopping an exam late, communicating with other students about exam before the exam is picked up will be penalized. Put down your writing instruments promptly when told that the time for the exam is at an end. If the exam proctor leaves the class without a student's exam at the end of the exam, the student will receive a grade of zero on the exam.
- **After an exam:** Once graded, the exams will be handed out and reviewed in class. The exams must be turned in when requested. If the exam is not provided back to the instructor and the instructor leaves the room without the exam, the student will receive a grade of zero for the exam. Students who wish to see their graded exams, after the review in class, must visit the instructor during office hours. Copies of the exams are not allowed or provided. The instructor highly encourages students who perform poorly on exams to come and discuss results with the instructor during office hours.

Attendance: At the University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this class, I will not take regular attendance. You are responsible for the material presented in class when you are absent. It is important that you attend class on a regular basis. This will save you a lot of preparation time for class exercises and exams. Attendance is not a direct part of your course grade.

However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

Other Requirements: As identified in the syllabus section "descriptions of major assignments and examinations", the class requires students to participate on a team of their class peers to apply the systems engineering principles and knowledge learned in this class. This will require that the teams be capable of conducting face-to-face and/or virtual meetings outside the classroom.

Class Courtesy: The instructor insists on a quiet classroom and asks that noise be minimized to ensure a quality and positive classroom experience for all students. This includes silencing cell phones/other audible devices before class and no discussions during class unless you are asking the instructor a question or there is an in-class exercise. Please go outside the class if you need to talk with others during the lecture. Students may be required to leave the class if problems are noted. Students who come to class late and once class has already started should try to enter the classroom as discreetly as possible. Due to noise in the hallway and to reduce distractions from those entering late, the door may be shut 5 minutes after class begins. Students who do not come to class within the first 5 minutes of the start of class may not be able to attend class if the door is locked. Please be courteous to the instructor and your fellow classmates.

Grading: Grades will be based on two exams (33% each), assignments and quizzes (24%), and the project(s) (10%). The team assignments and team project grades for an individual will be based, in part, on a peer evaluation that is performed at the end of the semester and reflects the student's contribution to the team effort over the semester. The peer evaluation may result in an adjustment of up to a letter grade for the student's team assignment and project grades. Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their grade drops below satisfactory levels. See "Student Support Services" for additional assistance.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aao/fao/).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA),* and *Section 504 of the Rehabilitation Act.* All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of **a letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting: **The Office for Students with Disabilities, (OSD)** http://www.uta.edu/disability/ or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information,

and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.

Title IX Policy: The University of Texas at Arlington ("University") is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit* www.uta.edu/titleIX or contact Ms. Michelle Willbanks, Title IX Coordinator at (817) 272-4585 or titleix@uta.edu.

Academic Integrity: Students enrolled in all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

> *I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*
>
> *I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. Additional information is available at https://www.uta.edu/conduct/. Plagiarism tutorials are available at: http://libguides.uta.edu/copyright/plagiarism and http://library.uta.edu/plagiarism/

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit http://www.uta.edu/news/info/campus-carry/

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as "lecture," "seminar," or "laboratory" are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback via the SFS database is aggregated with that of other students enrolled in the course. Students' anonymity will be protected to the extent that the law allows. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit http://www.uta.edu/sfs.

Final Review Week: for semester-long courses**,** a period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following

this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities. If you have a physical/sensory disability, please discuss your needs for assistance in the event of emergency evacuation with the instructor in private within the first two weeks of the semester.

Students are encouraged to subscribe to the MavAlert system that will send information in case of an emergency to their cell phones or email accounts. Anyone can subscribe at https://mavalert.uta.edu/ or https://mavalert.uta.edu/register.php.

Active Shooter: The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by UTA Police regarding the options and strategies we can all use to stay safe during difficult situations https://police.uta.edu/activeshooter.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at http://www.uta.edu/studentsuccess/success-programs/programs/resource-hotline.php.

The English Writing Center (411LIBR): The Writing Center offers **FREE** tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at https://uta.mywconline.com. Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see www.uta.edu/owl for detailed information on all our programs and services.

The Library's 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation. http://library.uta.edu/academic-plaza.

Inclement Weather Policy: If the University is closed, this class will not meet. Any scheduled lecture materials or examinations will be rescheduled to the next class period that the class meets. You can get information about closures by checking the main website at www.uta.edu.

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial 911. Non-emergency number 817-272-3381.

Course Schedule: *As the instructor for this course, I reserve the right to adjust this schedule when required and in any way that serves the educational needs of the students enrolled in this course.* Changes to the syllabus and associated schedule will be discussed in class and an updated syllabus will be posted in Blackboard. Students must comply with any changes to the syllabus once notified by the instructor.

Date	Lecture Topic
1/14	Introduction
1/21	Martin Luther King Jr. Day Holiday
1/28	Systems Thinking & Requirements Engineering Concepts
2/4	Requirements Engineering Concepts, Stakeholder Analysis
2/11	Requirements Elicitation
2/18	Requirements Elicitation
2/25	Requirements Analysis
3/4	Requirements Analysis, Requirements Specification, Requirements Management
3/11	Spring Break
3/18	**Exam 1**
3/25	Requirements Specification, Requirements Management
4/1	Requirements Risk Management, Validation
4/8	Validation, Verification
4/15	Verification
4/22	Special Topics
4/29	Special Topics, Project Presentations
5/6 **2-4:00pm**	**Exam 2**, Note that the final exam time is different than the normal class time.