CSE 5324-002

“Software EngineeringAnalysis, Design and Testing”

Fall 2015

**Instructor:** Steve Morgan.

**Office Number:** Engineering Research Building Room 651 (ERB 651).

**Department Office Telephone Number:** 817-272-3785.

**Email Address:** MorganS@UTA.edu,

**Faculty Profile:** <https://www.UTA.edu/profiles/> Stephen Morgan.
**Office Hours:** 1 – 3 PM, MoWeFr**.**

**Section Information:** CSE 5324-002.

**Time and Places of Class Meetings:** 9 - 9:50 AM, MoWeFr, Wolff Hall Room 308 (WH 308) on first class and exam days; i.e., 8/28, 10/9, 10/12, 10/14, 12/2, 12/4. Meet in ERB 125 on all other dates.

**Graduate Teaching Assistant** (GTA): Mahadevan Sudarsaran, mahadevan.sudarsanan@mavs.uta.edu, available by appointment only.

**Description of Course Content:** Software Engineering balances relationships among stakeholders, managers, developers, testers and marketers. This class demonstrates use of design patterns, agile practices and the Unified Modeling Language (UML) in facilitating communications among these disparate groups and enhancing their productivities.

**Student Learning Outcomes:** Studentswill learn to deliver high quality software on time and under budget. CSE5324-002 builds upon former CSE3310 students’ basic Software Engineering skills to produce entrepreneurs, who will succeed in today’s competitive global markets. Before each class, each student will study a PowerPoint “lecture” at home and assess its understanding with a multiple-choice quiz. With my coaching, the subsequent in-class lab exercise will *apply* what the student learned. Students earn grades on both the pre-class quizzes and the in-class lab exercises, both of which are completed in two-person (pair programming) teams. Their midterm and final exams are completed individually. (Daily teamwork and individual exams both model real working conditions in the engineering profession.)

**Required Textbooks and Other Course Materials:** Craig Larman’s *Applying UML and Patterns:* *An Introduction to Object-Oriented Analysis and Design and Iterative Development,* 3rd Ed., Prentice Hall, 2004. Every team will need a laptop computer for downloading IDEs and Web-based reference materials, plus a low-capacity thumb drive to carry over graphical UML files from prior lab assignments.

**Descriptions of major assignments and examinations:** Immediately after every class, the next lecture and its quiz can be downloaded from the CSE5324 directory at <http://Ranger.UTA.edu/~morgan>. Every *student’s* quiz answers must be entered in the left column of an Excel spreadsheet, which is emailed to CSE5324.2gta@gmail.com prior to 5 PM on the day before the next class. Every *team’s* in-class exercise solution must be emailed to CSE5324.2gta@gmail.com before 9:50 AM on the same day.

**Attendance:** At The University of Texas at Arlington, taking attendance is not required. Rather, 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 section, I expect every student to attend every class. Each in-class exercise is so complex that two students working together can get an A, but one student working alone probably will earn no better than a C.

**Grading**: The course grade will be the simple average of the midterm (25% of course grade) and final exam (25%) grades, with the averages of all quiz (25%) and all in-class exercise (25%) grades.

**Make-up Exams**: Every student’s missed quiz and in-class lab exercise will automatically receive a low C (70%), and it cannot be made up. Exams can be made up without a grade penalty, if the student was ill on exam day and can provide a doctor’s excuse for the absence, but an unexcused absence on exam day will result in a high F (59%) on the exam.

**Grade Grievances**: Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog. (See <http://catalog.uta.edu/academicregulations/grades/#graduatetext>.)

**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).** 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)** [www.uta.edu/disability](http://www.uta.edu/disability) or calling 817-272-3364.

**Counseling and Psychological Services, (CAPS)** [www.uta.edu/caps/](http://www.uta.edu/caps/) or calling 817-272-3671.

Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability) or by calling the Office for Students with Disabilities at (817) 272-3364.

**Title IX:** *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*](http://www.uta.edu/hr/eos/index.php)*. For information regarding Title IX, visit* [www.uta.edu/titleIX](http://www.uta.edu/titleIX).

**Academic Integrity:** Students enrolled 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 as they see fit in their courses, including (but not limited to) 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.

On the first class day, every student will sign a Confidentiality Agreement, which enables each team to freely share quiz and in-class exercise information with each other but not with other teams. This agreement models two engineering companies’ non-disclosure agreement, which enables limited sharing of trade secrets for the purpose of collaborating on a project, but specifically denies sharing trade secrets with competitors.

The instructor will make every effort to prevent all cheating. And he urges honest victims of cheating to describe how the cheating was done, so that it can be prevented in the future.

**Lab Safety Training:**  **Students registered for this course must complete all required lab safety training prior to entering the lab and undertaking any activities.** Once completed, Lab Safety Training is valid for the remainder of the same academic year (i.e., through the following August) and must be completed anew in subsequent years. There are no exceptions to this University policy. Failure to complete the required training will preclude participation in any lab activities, including those for which a grade is assigned.

**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>.

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as “lecture,” “seminar,” or “laboratory” shall be 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 enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

**Final Review Week:** 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. How best to exit the building will be explained on day one.

**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 [www.uta.edu/resources](http://www.uta.edu/resources).

**Writing Center.** **:** The Writing Center, 411 Central Library, offers individual 40 minute sessions to review assignments, *Quick Hits* (5-10 minute quick answers to questions), and workshops on grammar and specific writing projects. Visit [https://uta.mywconline.com/](https://owa.uta.edu/owa/luket%40exchange.uta.edu/redir.aspx?C=jqplelmmw0KcvkWv1pRv_rHS8ofUUtFIXl_CWZTLffEmCPyZf3x4ncUbBmD9p3gSPROCbhSJj7U.&URL=https%3a%2f%2futa.mywconline.com%2f" \t "_blank) to register and make appointments. For hours, information about the writing workshops we offer, scheduling a classroom visit, and descriptions of the services we offer undergraduates, graduate students, and faculty members, please visit our website at [www.uta.edu/owl/](http://www.uta.edu/owl/).

**Tentative Course Schedule**

(per [House Bill 2504](http://www.legis.state.tx.us/tlodocs/81R/billtext/html/HB02504F.HTM))

Fr 8/28 First class day—Administration (i.e., teaming, syllabus, safety, exits).

**Part I Introduction:**

Mo 8/31 Chapter 1—Object-Oriented Analysis & Design. Quiz 1, Lab 1

We 9/2 Chapter 2—Iterative, Evolutionary & Agile I. Q2, L2

Fr 9/4 Chapter 2—Iterative, Evolutionary & Agile II. Q3, L3

Chapter 3—Case Studies.

Mo 9/7 Labor Day Holiday.

**Part II Inception:**

We 9/9 Chapter 4—Inception is not the Requirements Phase. Q4, L4

 Chapter 5—Evolutionary Requirements.

Fr 9/11 Chapter 6—Use Cases I. Q5, L5

Mo 9/14 Chapter 6—Use Cases II. Q6, L6

We 9/16 Chapter 7—Other Requirements. Q7, L7

**Part III Elaboration Iteration I—Basics:**

Fr 9/18 Chapter 8—Iteration Basics. Q8, L8

 Chapter 9—Domain Models I.

Mo 9/21 Sections 9.6-9.14—Domain Models II. Q9, L9

We 9/23 Chapter 9—Domain Models III. Q10, L10

 Chapter 10—System Sequence Diagrams.

Fr 9/25 Chapter 11—Operation Contracts. Q11, L11

 Chapter 12—Requirements to Design—Iteratively.

Mo 9/28 Chapter 13—Logical Architecture & UML Pkg Diags. Q12, L12

 Chapter 14—On to Object Design.

We 9/30 Chapter 15—UML Interaction Diagrams. Q13, L13

Fr 10/2 Chapter 16—UML Class Diagrams I. Q14, L14

Mo 10/5 Chapter 17—GRASP—Designing Objects w/ Resp I. Q15, L15 \*

We 10/7 Sections 17.6-17.9—GRASP—Dsn Obj w/ Resp II. Q16, L16 “

Fr 10/9 Chapter 17—GRASP—Designing Objects w/ Resp III. Q17, L17 “

Mo 10/12 Practice midterm exam.

We 10/14 Students grade practice midterm exams in class as Quiz 18.

Fr 10/16 Midterm exam.

Mo 10/19 Chapter 18—Object Design Examples with GRASP. Q19, L18 “

We 10/21 Chapter 19—Designing for Visibility. Q20, L19

Fr 10/23 Chapter 20—Mapping Designs to Code. Q21, L20

Mo 10/26 Chapter 21—Test Driven Development & Refactoring. Q22, L21

 Chapter 22—UML Tools & UML as Blueprint.

**Part IV Elaboration Iteration 2—More Patterns:**

 Chapter 23—Iteration 2—More Patterns.

We 10/28 Chapter 24—Quick Analysis Update. Q23, L22 \*

Chapter 25—GRASP—More Objects with Responsibilities.

Fr 10/30 Chapter 26—Applying GoF Design Patterns I. Q24, L23

Mo 11/2 Chapter 26—Applying GoF Design Patterns II. Q25, L24

We 11/4 Chapter 27—Iteration 3—Intermediate Topics. Q26, L25

 Chapter 28—UML Activity Diagrams & Modeling.

 Chapter 29—UML State Machine Diagrams & Modeling.

Fr 11/6 Chapter 30—Relating Use Cases. Q27, L26

 Chapter 31—Domain Model Refinement I.

Mo 11/9 Chapter 31.10+—Domain Model Refinement II. Q28, L27

 Chapter 32—More SSDs & Contracts.

We 11/11 Chapter 33—Architectural Analysis. Q29, L28

Fr 11/13 Chapter 34—Logical Architecture Refinement. Q30, L29

Mo 11/16 Chapter 35—Package Design. Q31, L30

 Chapter 36—More Object Design with GoF Patterns I.

We 11/18 Chapter 36.4+—More Object Design with GoF Patterns II.Q32, L31

Fr 11/20 Chapter 37—Patterned Persistence Framework I. Q33, L32

Mo 11/23 Chapter 37—Patterned Persistence Framework II. Q34, L33

 Chapter 38—UML Deployment & Component Diagrams.

We 11/25 Chapter 39—UML & N+1 View Model Architecture I. Q35, L34

Fr 11/27 Thanksgiving Holiday.

**Part VI—Special Topics:**

Mo 11/30 Chapter 39—UML & N+1 View Model Architecture II. Q36, L35

Chapter 40—Iterative Devel & Agile Project Mgmt.

We 12/2 Practice final exam.

Fr 12/4 Students grade practice final exams in class as Quiz 37.

Mo 12/7? Developing Karim Sawabogo’s Robot—no quiz. L36

We 12/9? Small Business Incubators—no quiz. L37

We 12/16 Final Exam, 8-10:30 AM, location TBA.

Note: As instructor of this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. I shall do my best to advise students of changes in a timely manner. –Stephen M. Morgan.

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.

For non-emergencies, contact the UTA Police Department at 817-272-3381.