

CSCI 3341.01: Software Engineering II

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Class Hours: MW: 3:05pm - 4:20pm

Office Hours: MW: 1:30-2:30pm

Class Room: COLL OF BUSINESS ENTR 113

Office: IEAB 3.226

Textbooks

This course will not follow a formal textbook, however, students will be assigned required readings from a variety of sources.

Catalog Description

The course will cover the analysis of requirements and software architecture with a major emphasis on object design, implementation, testing and validation, maintenance and software re-engineering. Methods for evaluating software for correctness, and reliability, system testing techniques, testing tools and limitations of testing, Advance Software Engineering topics such as Design Patterns, Aspect Oriented Engineering, Interactive Design Methods, and Formal Specification are included. Students will work a large group projects. Equivalent course: CMPE 3341. A student may receive credit in only one course.

Objectives

This course is intended to provide the student with an introduction to contemporary software engineering. This course utilizes the Flutter framework to develop cross-platform software for iOS and Android devices. This course is intended to bridge the gap between academic computer science and production software engineering. Fast-paced introductions to key tools and techniques will be given (debugging, front-end development, user experience design, user interface design, APIs, payments, and more). Over the course of the class, students will work in groups to develop and test mobile applications.

Prerequisites

CSCI 3340 or CMPE 3340.

Grading Policy

- 50% of your grade will be determined by timed progress assessments during normal class hours,
- 50% of your grade will be determined by assignments (in-class or at home)

Assignments

These are expected to be organized and well documented. The specific details for grading and documentation will be given at the time of the assignment.

Assignments will be graded on correctness, quality, and style. You **MUST** submit ALL homework/programming projects, with no exceptions, in order to get overall credit for the assignments/programming projects. All homework must be turned in on Blackboard and must be completely legible. Any portion which is not clearly and easily legible will receive a 0. All assignments /programming projects must be submitted using the tool provided by Blackboard. I will not accept assignments / programming projects through e-mail or by hard copy. Also, all programming projects must compile or they will receive a 10% AT MOST.

Late Policy

All assignments should be turned in on their due date. Programs turned in late will be graded on the following basis:

- **10 point penalty** if turned in within 24 hours late
- **20 point penalty** if turned in within 48 hours late
- **No points awarded** if more than 48 hours late

Make up progress assessments will not be given except by my prior consent. You must notify me within 24 hours after missing the assessment so that I may determine the appropriateness of allowing a make up exam. Examples of acceptable excuses would be the death of an immediate family member, or an illness requiring physician's attention.

Expectations

I am committed to quality teaching and to providing you a meaningful experience in this course but learning is your responsibility so please do your part in order to receive the maximum benefit from the course.

For this class, **I expect you to:**

- **Have your electronic devices (cell phones, notebooks, music players, etc.) OFF at all times (tests, and lectures).**
- Attend each class, arrive on time and remain in the classroom throughout the entire class meeting. If you have a legitimate and important reason for needing to leave early, please let me know before class starts.
- Complete all assignments and submit them on time (this is very important for you!).
- Interact respectfully with me, the course assistants, and your other classmates.
- Participate in class discussions and activities.
- **Remain on task and focused during class (i.e., no doing homework, engaging in side conversations, web-surfing, reading e-mail, Facebooking, chatting, IMing, etc. during class).**

- Access your Blackboard account frequently to get information on course policies, assignments, tests, grades, etc. **All information posted on it will be assumed to be known by the student 24 hours later.**
- Come speak to me IN PERSON and IMMEDIATELY at the **first** sign that you are having trouble with the class or if you miss assignments so I can try to help you.

Tentative Topics

The following is a general list of topics for the course and may be revised as the semester progresses.

Backend Development with Ruby

1. Review of Ruby and Sinatra
2. Building APIs, JSON Format Details
3. Token Based Authentication for APIs
4. Deployment to Heroku
5. Microservices

Mobile UI Development with Flutter

1. Introduction to Flutter, Android Studio, VS Code
2. Layout basics
3. Stateless Widgets
4. Introduction to Dart
5. Consuming APIs
6. Stateful Widgets
7. Animations
8. Firebase and Firestore

Theory

1. Software Process and Models
2. Agile Software Development
3. Software Testing and Configuration Management
4. System Modeling
5. Software Project Management
6. Software Re-engineering

Important Dates

- January 14 - First day of classes
- January 17 - Last day to add a course or register for spring 2019
- January 21 - Martin Luther King Jr. Day - NO classes
- April 10 - Last day to drop a course; will count toward the 6-drop rule
- April 19-20 - Easter Holiday - NO classes
- May 2 - Study Day - NO classes
- May 3-9 - Final Exams
- May 10-11 - Commencement Exercises

There will not be a Final Exam for this course.

Learning outcomes

At the end of this course, the student should be able to

1. Be able to apply basic math, problem solving techniques, and programming constructs to add or improve features of a software system.
2. Be a productive member of a group that works on a software project.
3. Understand the principles of software engineering.
4. Understand and be fluent in the use of software engineering terminology and nomenclature.
5. Be capable of intelligently communicating with most members in a software development organization.
6. Be able to identify the technical architecture of existing software systems.
7. Be able to use a modern collaborative workflow using source control (Git/Github).
8. Understand/implement software testing and know how it relates to contributing to software projects.
9. Understand different processes for designing software: Waterfall, Agile, Scrum, etc.
10. Understand the basics of designing a database and describing that database using UML.
11. Be able to understand the ethics and security concerns behind: password management, authentication, authorization, billing, and PCI-compliance.
12. Be able to understand the need to be *fluid* and continue learning different programming languages, paradigms, frameworks, and tools.

13. Be able to describe the impact of various software products on our day-to-day lives and society.
14. Be able to take a software idea and create a plan/architecture for how it can be implemented.
15. Be able to work on, modify, and contribute to traditional software projects as well as web applications.
16. Be able to model data, data dependencies, and data relationships using UML.
17. Be able to design and implement database systems.
18. Be able to incorporate external databases into traditional object-oriented class design.
19. Be able to create presentations and supporting documentation to communicate your software project ideas, discuss the implementation of your software projects, and defend the viability of your software projects as it relates to the current commercial landscape.
20. Be knowledgeable of ethics, professionalism, and cultural diversity in the work environment.
21. Be able to design user interfaces using Google's Material Design language
22. Be able to implement user interface designs in Flutter
23. Be able to understand and develop applications that use Backend APIs and Mobile frontends

ABET Student Learning Outcomes

1. An ability to analyze a problem, and to identify and define the computing requirements appropriate to its solution.
2. An ability to design, implement, and evaluate a computer-based solution to meet a given set of computing requirements in the context of the discipline.
3. An ability to communicate effectively with a range of audiences about technical information.
4. An ability to make informed judgments in computing practice based on legal and ethical principles
5. An ability to function effectively on teams to establish goals, plan tasks, meet deadlines, manage risk, and produce deliverables.
6. An ability to apply theory in the design and implementation of computer-based solutions.
7. An ability to reason about and explain computer-based solutions at multiple levels of abstraction.

Students with Disabilities

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services.

Pregnancy, Pregnancy-related, and Parenting Accommodations Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.

Student Accessibility Services: Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

Mandatory Course Evaluation Period

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu>); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available:

- Module 1: February 13 - 19
- Module 2: April 10 - 16
- Full Spring Semester: April 10 - May 1

Attendance

Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

Scholastic Integrity

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion;

submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

Sexual Harassment, Discrimination, and Violence

In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct and discrimination. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at 665-8287, 882-8282, or OVAVP@utrgv.edu.

Course Drops

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

Student Services:

Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Learning Center, Writing Center, Advising Center and Career Center. The centers provide services such as tutoring, writing help, critical thinking, study skills, degree planning, and student employment. Locations are:

- Learning center: BSTUN 2.10 (Brownsville) or ELCTR 100 (Edinburg)
- Writing center: BLIBR 3.206 (Brownsville) or ESTAC 3.119 (Edinburg)

- Advising center: BMAIN 1.400 (Brownsville) or ESWKH 101 (Edinburg)
- Career center: BCRTZ 129 (Brownsville) or ESSBL 2.101 (Edinburg)