Software Engineering: COSC 6370
School of Engineering & Computing Sciences
Spring 2020

A. COURSE INFORMATION

Course number/section: 6370.001
Class meeting time: M 3.30 – 4.45 – W Online
Class location: RFEB-107
Course Website: TBD

B. INSTRUCTOR INFORMATION

Instructor: Mario A. Garcia
Office location: CI 324
Office hours: T – TH 9.15 – 11.45
Telephone: 825 3478
e-mail: mario.garcia@tamucc.edu
Appointments:

C. COURSE DESCRIPTION

The application of engineering principles to the development and maintenance of high quality large software systems, delivered on time and within budget, including the development and application of processes and tools for managing the complexities inherent in creating these systems.

D. PREREQUISITES AND COREQUISITES

Prerequisites

Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
Software Engineering, I. Sommerville, Pearson Education, 10th Ed.
https://iansommerville.com/software-engineering-book/

Optional Textbook(s) or Other References
Software Engineering: A Practitioner’s Approach, R.S. Pressman, McGraw Hill, 8th Ed.
F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

- Describe the basic concepts of software engineering
- Understand the significance of engineering and programming to software development
- Utilize a variety of techniques to develop good requirements
- Use pseudocode and other techniques for component design
- Understand the use of data flow diagrams
- Develop strategic test plans
- Compute significant software metrics
- Discuss current developments in software engineering
- Understand effective project management techniques

By the end of this course, students should be able to:

1. Achieve team-assigned tasks
2. Listen and communicate in team settings
3. Meet deadlines and team duties
4. Apply current software development methodologies or techniques
5. Apply software principles to solutions to problems of varying complexity
6. Apply documentation principles in the construction of software systems

G. INSTRUCTIONAL METHODS AND ACTIVITIES

This course will be a mixture of lectures and discussions. The student is expected to actively participate in all class activities. The student is also expected to do outside work on assignments and reading.

Attendance and Preparation Expectations and Policies
1. This course is a hybrid course – It is a combination of face-to-face lecture and online using Blackboard.
2. Lecture will be on Tuesday. Online discussion; project presentations Thursday
3. A minimum of 2 hours of preparation for each hour of lecture should be the norm.
4. Assigned readings should be completed before class. Questions from readings should be brought up in class.
5. Seek help early. Don’t wait until poor performance on exams.

**Courtesy Expectations**
1. Please be in class on time. Late students disrupt class.
2. If you prefer to sleep or play with your cellphone, do not come to class.

**H. MAJOR COURSE REQUIREMENTS AND GRADING**

Grade Scale: A (90-100%)  B (80-89%)  C (70-79%)  D (60-69%)  F (<60%)

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Midterm Exam</td>
<td>20</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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<tr>
<td>Team Project with Multiple Deliverables</td>
<td>50</td>
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<tr>
<td>Research Paper</td>
<td>10</td>
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</tbody>
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**I. COURSE CONTENT/SCHEDULE**

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Introduction and Overview</td>
<td>1</td>
<td>Read Chapter 1</td>
</tr>
<tr>
<td>Week 2</td>
<td>The Software Process</td>
<td>2</td>
<td>Read Chapter 2</td>
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<tr>
<td>Week 3</td>
<td>Agile Software Development</td>
<td>3</td>
<td>Read Chapter 3, Team Assign. 1</td>
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<td>Week 4</td>
<td>Requirements Engineering, System Modeling</td>
<td>4,5</td>
<td>Read Chapter 4,5 Team Assign. 2</td>
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<td>Week 5</td>
<td>Architectural Design, Design and Implementation</td>
<td>6,7</td>
<td>Read Chapter 6,7 Team Assign 3 Quiz Ch 6,7</td>
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<td>Week 6</td>
<td>Software Testing</td>
<td>8</td>
<td>Read Chapter 8 Quiz Ch 8</td>
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<td>Week 7 October 8</td>
<td>Midterm Exam</td>
<td></td>
<td>Read Chapter 11,12,13 Team Assign. 4 Quiz Ch 11,12,13</td>
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<tr>
<td>Week 8</td>
<td>Reliability Engineering, Safety Engineering, Security Engineering</td>
<td>11, 12, 13</td>
<td>Read Chapter 11,12,13</td>
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3
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<thead>
<tr>
<th>Week</th>
<th>Course</th>
<th>Credits</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>9</td>
<td>Resilience</td>
<td>14</td>
<td>Read Chapter 14, Team Assign. 5, Quiz Ch 14</td>
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<tr>
<td>10</td>
<td>Software Reuse</td>
<td>15</td>
<td>Read Chapters 15, Quiz Ch 15</td>
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<tr>
<td>11</td>
<td>Project Management</td>
<td>22</td>
<td>Read Chapter 22, Team Assign. 6, Quiz Ch 22</td>
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<tr>
<td>12</td>
<td>Project Planning</td>
<td>23</td>
<td>Read Chapters 23, Team Assign. 7, Quiz Ch 23</td>
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<tr>
<td>13</td>
<td>Quality Management</td>
<td>24</td>
<td>Read Chapter 24, Team Assign. 8, Quiz Ch 24</td>
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<tr>
<td>14</td>
<td>Configuration Management</td>
<td>25</td>
<td>Read Chapter 25, Final project presentations</td>
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<td>15</td>
<td>Final Project Presentations</td>
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<td>Final project presentations</td>
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**Final Exam on**

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

**Programming Project: Phase 1: 20 points**

Use Cases Due date: 5 points
- a. User account creation – Registration
- b. Password validation (8 characters)
- c. Password Validation Lower case, upper case, special characters
- d. Password Validation. Wrong password used more than 3 times – Account blocked

Use Cases Testing: 5 points
- a. User account creation – Registration
- b. Password validation (8 characters)
- c. Password validation lower case, upper case, special characters

Design: (Using Selected UML tool) 5 points
- a. Context model
- b. Sequence model
- c. Object model – classes, Objects, Attributes, Methods
- d. Project plan – Using Microsoft Project
Implementation 5 points October
   a. Pair programming – code
   b. Individual report about pair programming experience

Programming Project: Phase 2: 20 points

Use Cases Phase II 5 points
   Example: Online Computer Store
   a. Requirement 1 - Laptops
   b. Requirement 2 - Desktops
   c. Requirement 3 - Mainframes

Use Cases Testing: Due Date: 5 points
   a. Requirement 1 - Laptops - Test case
   b. Requirement 2 - Desktops
   c. Requirement 3 - Mainframes

Design Phase 2 Design: (Using Selected UML tool) 5 points
   a. Context model
   b. Sequence model
   c. Object model – classes, Objects, Attributes, Methods
   d. Project plan – Using Microsoft Project
   e. User Interface Design

   Final Implementation 20 points
   a. Pair programming – code
   b. Individual report about pair programming experience

J. COURSE POLICIES

Attendance/Tardiness
   You are expected to be in attendance, punctual, and prepared for class. If you are more than 5 minutes late to class, you will be counted as tardy. Please make sure that you will never be tardy to any of your classes or accept the consequences.

Late Work and Make-up Exams
   NO makeup exams, assignments, or quizzes will be allowed unless I have agreed prior to the exam, assignment, or quiz time and been provided with official supporting documents.

Extra Credit
   There is NO EXTRA CREDIT - don't bother asking.

Cell Phone Use
You are required to turn off your cell phone in class and pay attention to class discussions.

**Laptop Use**
Use of laptops and other electronic devices is restricted to taking notes.

**Food in Class**
Eating food in class is Not Allowed.

**Missed Exam**
Missed exams will be graded as ‘0’.

**Participation**
Class discussions and information provided in class are considered regular course material; it is your responsibility to take appropriate notes. You are expected to attend lectures and actively participate in class discussions.

**Others**
Read Section L!!!

**K. COLLEGE AND UNIVERSITY POLICIES**

- **Academic Integrity (University)**
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
  See Full University Policy at [http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity](http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity)

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action,
visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  http://disabilityservices.tamucc.edu/

**L. OTHER INFORMATION**

These guidelines are designed to inform scholars of their responsibilities and of the course requirements in order to make this course a positive experience. The instructor is always available for consultation and discussion with students on any aspect of a course and of these general guidelines.

1. Consider yourself as a scholar rather than a student. The term “student” may imply some passivity, whereas the term “scholar” implies active participation, understanding
and searching. We will use these terms interchangeably with the meaning of “scholar” implied. Osmosis does not work in a learning environment!

2. Further, define yourself as a “thinking explorer”. You are responsible for your education; an instructor can only be a guide and a facilitator. An instructor cannot learn for you. If you come across something that really interests you, explore it further.

3. Your experience at this University should not consist of passing a series of courses to earn a degree. Your experience should rather be a series of activities that will give you an education.

4. Concentrate on “learning to learn”. You will have to be a life-long learner to survive in your chosen career.

5. There is no such thing as a stupid question; there is such a thing as a stupid answer. So ask questions, the instructor is taking all the risks! Ask questions of your instructor and of your fellow scholars. Many times questions are more important than answers.

6. The Internet is a tremendous resource and also a great danger. When you find information on the Internet, you have no idea if it is correct. View such information with caution. But, use the Internet to explore topics that interest you. Do not only prepare for the exam in a course – learn as much as you can on the topics introduced to you by the course material. You are responsible for the extent of your education!

READ MINDFULLY !!!!

7. In addition to details of the syllabus given in class, the syllabus for the course includes all the chapters of the required textbook/s unless indicated otherwise by the instructor.

8. The final letter grade for the class will be based on the raw composite numerical score obtained from the weighted average of the tests, quizzes, exams, labs, etc. as indicated by the instructor. The raw composite numerical score may be adjusted (curved) based on the highest score, the statistical profile of the scores and other academic standards or other considerations. Generally the letter grade of A is 90% and over of the adjusted score, a B is between 80% and 89% (inclusive) of the adjusted score, a C is between 70% and 79% (inclusive) of the adjusted score, a D is below 70% of the adjusted score and an F is below 65% of the adjusted score. An incomplete (I) will only be given in very unusual circumstances. The University regulations on incomplete grades state: “An incomplete notation may be given to a student who is passing but has not completed a term paper, examination, or other required work for reasons beyond the student’s control other than the lack of time”. Students are expected to take ALL tests, quizzes, exams, etc., and to complete and hand in all labs and other assignments. There is no provision for “extra credit”. No final grades will be given via the telephone, e-mail, etc.

9. All University rules, regulations and expected student conduct apply to this course. Students are held responsible for the information given in the current Catalog and Student Handbook.

10. All labs, assignments, etc. must be handed in on the assigned due date. Scholars having problems must notify the instructor well before the due date. Marks will be deducted for poor and sloppily presented work.

11. Labs, etc. handed in after the due date may be subject to a penalty of loss of marks. Labs, etc. handed in after the graded labs, etc. have been returned to students will get zero marks but must be handed in to the instructor.
12. Scholars are asked to take special note of the penalties, which the University attaches to Academic Dishonesty. Consult the Student Handbook.

13. All work handed in to the instructor must be the student’s own work. Extracts, excerpts, etc. from the work of others must be suitably noted, acknowledged and properly referenced. Any Group Work will be judged in the same way. That is, it is the work of the group and the extracts, excerpts, etc. of others must be acknowledged.

14. All written and graphical work handed in must be presented neatly printed. Student’s written work will be judged on written communication skills, critical thinking and problem solving ability.

15. There are NO provisions for making up missed exams except in cases where prior arrangements have been made and agreed to by the instructor.

16. Students must keep their given university e-mail address (i.e. firstname.lastname@islander.tamucc.edu). This will be the means of the instructor communicating with students.

17. All work submitted to the instructor (via e-mail or other means) must be clearly marked with the student’s name and the name and number of the course – this is especially important when work is submitted as an attachment to an e-mail.

18. The instructor reserves the right to make changes to the above with due notice to the students. These changes will be announced to the class (see 16 above) and each student is responsible for keeping herself/himself informed of such changes.

GENERAL DISCLAIMER
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.

Software Projects

40 Side Project Ideas for Software Engineers
https://www.codementor.io/npostolovski/40-side-project-ideas-for-software-engineers-g8xckyxef

Computer Science Projects https://www.geeksforgeeks.org/computer-science-projects/

Software Project Ideas
https://nevonprojects.com/project-ideas/software-project-ideas/