Introduction to Problem Solving with Computers II, COSC 2437.001
Department of Computing Sciences
Fall 2019

A. COURSE INFORMATION

Course number/section: COSC 2437.001
Class meeting time: TR 09:30-10:45 AM (Lecture)
                    R 11:00 AM -12:50 PM (Lab Section 2437.201)
                    R 01:00 PM - 02:50 PM (Lab Section 2437.301)
Class location: CI-108 (Lecture); CI-228 (Lab)
Course Website: bb9.tamu.edu

B. INSTRUCTOR INFORMATION

Instructor: Marwa Hassan
Office location: EN 316J
Office hours: M 11:00 AM - 01:00 PM
             F 09:00 AM - 10:00 AM
             11:00 AM - 01:00 PM
Telephone: (361) 825-3248
e-mail: marwa.hassan@tamucc.edu
Appointments: Please email for appointments

C. COURSE DESCRIPTION

This course provides a thorough study of standard structures used in the storing and retrieving of data and the process by which these structures are created and manipulated. Topics include: abstract data types, linked lists, trees, hashing, stacks, queues, sorting, searching, and recursion.

D. PREREQUISITES AND COREQUISITES

Prerequisites
COSC 1436 and MATH 2305

Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)

Optional Textbook(s) or Other References
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.

- Understand and use searching and sorting algorithms.
- Understand the concept of algorithm efficiency and be able to determine the Big-O efficiency of an algorithm.
- Understand the concept of object-oriented programming through the use of abstract data types.
- Understand and use dynamic memory allocation to create list, stack, and queue data structures.
- Understand and use dynamic memory allocation to create tree data structures.
- Be able to analyze and select appropriate data structures to implement a solution to a problem.
- Understand and use recursion to solve a problem.
- Understand the basic concepts of graph data structures and some of the algorithms associated with graphs.

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

1. Use knowledge of both computing and mathematics to obtain an efficient and cost-effective solution for a computing problem
2. Analyze a given problem or a system
3. Design a computer-based system, process, component, or program to meet desired needs
4. Apply current software development methodologies or techniques
5. Understand the differences in space/time complexity of algorithms.
6. Apply software principles to solutions to problems of varying complexity

Assessment of objectives will be conducted through homework assignments, quizzes and exams.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

This is an intermediate level course. However, this is a difficult course that demands all students attend all classes! Regular completion of all reading, homework, and other outside assignments, are absolutely essential for success in this course.

The methods and activities for instruction will include but not limited to:
- Presentation of new material and concepts in the classroom using lecture, tutorials, and sample programs.
- Classroom and lab discussions.
- Lab assignments to review and reinforce topics covered in the classroom.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Your course grade will be decided on your performance in the lab activities, assignments, quizzes, two midterm exams, and the final exam. The distribution of points is as follows:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>15</td>
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<tr>
<td>Exam 2</td>
<td>15</td>
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<tr>
<td>Final Exam</td>
<td>20</td>
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<tr>
<td>Assignments</td>
<td>20</td>
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<tr>
<td>Programming Quizzes</td>
<td>10</td>
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<tr>
<td>Lab Activities</td>
<td>10</td>
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<tr>
<td>Class Participation and Quizzes</td>
<td>10</td>
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Grading scale: A: 100-90, B: 89-80, C: 79-70, D: 69-60, and F: 59-0.

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Introduction and Overview</td>
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<tr>
<td>Week 2</td>
<td>Software Engineering Principles, Object-Oriented Design (OOD)</td>
<td>1, 2</td>
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<tr>
<td>Week 3</td>
<td>Object-Oriented Design (OOD), Pointers</td>
<td>2, 3</td>
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<td>Week 4</td>
<td>Linked Lists</td>
<td>5</td>
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<td>Week 5</td>
<td>Recursion</td>
<td>6</td>
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<tr>
<td>Week 6</td>
<td>Recursion - Exam 1</td>
<td>-</td>
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<tr>
<td>Week 7</td>
<td>Stacks</td>
<td>7</td>
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<tr>
<td>Week 8</td>
<td>Queues</td>
<td>8</td>
</tr>
<tr>
<td>Week 9</td>
<td>Searching and Hashing Algorithms</td>
<td>9</td>
</tr>
</tbody>
</table>
Week 10 | Searching and Hashing Algorithms – Exam 2 | 9
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Week 11 | Sorting Algorithms | 10
Week 12 | Binary Trees and B-Trees | 11
Week 13 | Binary Trees and B-Trees | 11
Week 14 | Graphs | 12
Week 15 | Graphs | 12

Final Exam: **Thursday, December 12th**
8:00 a.m. – 10:30 a.m.

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor.

**J. COURSE POLICIES**

**Attendance/Tardiness**
The students are expected to come to class on time every day the class meets. Attendance and active participation are crucial. Read the chapter to be discussed before coming to class. Ask questions of material you do not understand. If I cannot explain the answers to your satisfaction, make an appointment with me to discuss the question. You are responsible for all material presented in class. Demonstrate integrity, maturity, and ethical behavior.

**Make-up Exams**
Makeup exams will not be given under normal circumstances. If you notify me immediately that serious, unavoidable, documentable (e.g., with a letter from your doctor) circumstances have arisen, I will discuss options for replacing the missing grade. (For example, I may allow the grade earned on the comprehensive final to replace the grade for the missed exam.) Excused absences due to school sponsored activities, religious observations, family rituals, etc. should be discussed in advance.

**Assignments**
Due dates are listed in each assignment. Assignments are accepted until the specified due date.
- Late work penalty: 25% if one day late (up to 24 hours late); 50% if two days late (from 24 to 48 hours late); zero credit if more than two days.

*Be sure to backup copies of all your programs. Note that any kind of hardware or software failure or machine unavailability in the lab does not merit an extension on the assignment.*

**Collaboration**
The assignments are to be completed individually unless instructed otherwise. You may
ask each other for general advice, but do NOT share final answers and/or source code. Be sure to protect your work. Working with others without the specific permission of the instructor on assignments that will be submitted for a grade is considered unauthorized collaboration and will be treated as copying. Action will be taken as discussed under the academic honesty policy. If unsure about the limits, students must seek the instructor’s permission before working with one another.

Electronics
- Turn off all electronic devices including cell phones when you enter the classroom.
- Use of computers is only allowed for taking notes and class-related activities. Surfing the Internet, playing games, or otherwise participating in distracting behavior are not allowed and will result in automatic grade reduction and/or being asked to leave class.

Food in Class
No food is allowed in the class or labs.

K. COLLEGE AND UNIVERSITY POLICIES

• Academic Integrity (University)
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

• 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.

• Statement of Civility
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial
origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. *Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.* Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/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](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](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/](http://disabilityservices.tamucc.edu/)
• **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. **OTHER INFORMATION**

• **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**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.