

## **COSC 3351-110 Data Structures**

Fall 2017 rev. 04.18.2018

Texas A&M University - Central Texas

### **INSTRUCTOR AND CONTACT INFORMATION**

**Instructor: Dr. Timothy G. Woodcock**

**Office: 323G Founders Hall**

**Phone: 254-519-5783**

**Email: [WoodcockTG@tamuct.edu](mailto:WoodcockTG@tamuct.edu) Please only use this email**

#### **Office Hours:**

Office Hours are Monday and Wednesday from 3pm to 5pm and by appointment.

#### **Mode of instruction and course access:**

This course is a face-to-face class with some supplemental readings made available online using the TAMUCT Canvas Learning Management System: [<https://tamuct.instructure.com>]  
Homework will be assigned, collected, and graded in Canvas.

#### **Student-instructor interaction:**

I prefer that you do not phone me. I will check email often Monday through Thursday.

#### **911 Cellular:**

Emergency Warning System for Texas A&M University – Central Texas

911Cellular is an emergency notification service that gives Texas A&M University-Central Texas the ability to communicate health and safety emergency information quickly via email, text message, and social media. All students are automatically enrolled in 911 Cellular through their myCT email account.

Connect at [911Cellular](https://portal.publicsafetycloud.net/Texas-AM-Central/alert-management) [<https://portal.publicsafetycloud.net/Texas-AM-Central/alert-management>] to change where you receive your alerts or to opt out. By staying enrolled in 911Cellular, university officials can quickly pass on safety-related information, regardless of your location.

### **COURSE INFORMATION**

#### **Course Overview and description:**

Study theory and applications of commonly used computer data structures, files, file organization and access methods, databases, and other storage and retrieval methods. Prerequisite(s): CIS 3340 or CIS 3341 or CIS 3342 or CIS 3343 or permission of department chair.

#### **Course Objective:**

- a. Describe data structures included as primitives, in modern programming languages.
- b. Employ the array data structure including addressing methods inherent in arrays and use of arrays to implement more complex data structures.
- c. Employ a “class” as a means for implementing a programmer-defined data type.

- d. Compose programs using dynamic memory allocation and the use of pointers and pointers to objects for implementing more complex data structures.
- e. Employ the major programmer-defined data structures to include stacks, queues, linked-lists, trees, and graphs in programs.
- f. Discuss the "space versus time versus complexity" trade-off in designing programs. Each data structure will be evaluated for strengths and weaknesses in terms of space time complexity. Explain the "big-O" notation used to compare algorithm efficiency.
- g. Develop the complex algorithms used to implement and dynamically optimize trees.

**Student Learning Outcomes:**

1. Student will construct programs using the following kinds of data structures: Arrays, stacks, queues, maps, hash tables, lists, collections, and binary trees.
2. Student will be able to describe how each data structure works including the strengths and weaknesses.
3. Students will be able to develop software using these data structures and explain why the data structures were chosen.

**Competency Goals Statements (certification or standards): None**

**Required Reading and Textbook(s):**

“Object Oriented Data Structures Using JAVA” 4<sup>RD</sup> Ed., Dale, Joyce, and Weems

**COURSE REQUIREMENTS**

Course Requirements:

- Grades will be based on two exams (midterm and final exams) and 8 programming assignments.
- All programs are required to have a GUI as the interface to the program.
- All programs will be submitted via gethub.
- All assignments and exams will be available in Canvas.

**Grading Criteria Rubric and Conversion**

Assignment	Total Points
Mid-term Exam	100
Final Exam	100
Projects	800

Grade	Points
A	900-1000
B	800-899
C	700-799
D	600-699
F	Below 600

**Posting of Grades**

- All grades will be posted in Canvas.
- All assignments turned in on time will be graded within 2 weeks of the due date.

## COURSE OUTLINE AND CALENDAR

### Complete Course Calendar

Week	Date	Reading	Homework
1	8/29/2017	Chapter 1	
2	9/5/2017	Chapter 2	
3	9/12/2017	Chapter 3	Project 1
4	9/19/2017	Chapter 4	Project 2
5	9/26/2017	Chapter 5	Project 3
6	10/3/2017	Chapter 6	Project 4
7	10/10/2017	Chapter 7	Project 5
8	10/17/2017	Mid-Term Exam	
9	10/24/2017	Chapter 8	
10	10/31/2017	Chapter 9	Project 6
11	11/7/2017	Chapter 10	
12	11/14/2017	Special Topics	Project 7
13	11/21/2017	Thanksgiving	
14	11/28/2017	Chapter 11	Project 8
15	12/5/2017	Final Exam	
16	12/12/2017	Special Topics	

#### Important University Dates:

August 28, Add/Drop/Late Registration begins

August 30, Add/Drop/Late Registration ends, 16-week and 1st 8-week classes

September 1, Priority Deadline to Submit Graduation Application

September 4, Labor Day, CAMPUS CLOSED

September 5, Last day to drop 1st 8-week classes with no record

September 13, Last day to drop 16-week classes with no record

September 22, Last day to drop a 1st 8-week class with a Q or withdraw with a W

October 6, Deadline to submit graduation

October 20, Last day to withdraw from the University (1st 8-week classes WF)

October 23, Add/Drop/Late Registration begins, 2nd 8-week classes

October 26, Add/Drop/Late Registration ends, 2nd 8-week classes

October 30, Last day to drop 2nd 8-week classes with no record

November 10, Veteran's Day

November 10, Last day to drop with a Q or withdraw with a W (16-week classes)

November 17, Last day to drop a 2nd 8-week class with a Q or withdraw with a W

November 23-24, Thanksgiving, CAMPUS CLOSED

December 15, Last day to withdraw from the University (16-week and 2nd 8-week classes)

December 15, Last day to file for Degree Conferral (Registrar's Office)

December 15, Commencement (End of Fall Term)

December 25-January 1, WINTER BREAK

## TECHNOLOGY REQUIREMENTS AND SUPPORT

### Technology Requirements.

This course will use the TAMUCT Instructure Canvas learning management system.

Logon to TAMUCT Canvas [<https://tamuct.instructure.com>]

Username: Your MyCT username

(xx123 or everything before the "@" in your MyCT e-mail address)

Password: Your MyCT password

### Technology Support.

For technology issues, students should contact Help Desk Central.

24 hours a day, 7 days a week:

Email: [helpdesk@tamu.edu](mailto:helpdesk@tamu.edu)

Phone: (254) 519-5466

[Web Chat](http://hdc.tamu.edu): <http://hdc.tamu.edu>

*When calling for support please let your support technician know you are a TAMUCT student.*

For issues related to course content and requirements, contact your instructor.

## UNIVERSITY RESOURCES, PROCEDURES, AND GUIDELINES

### Drop Policy.

If you discover that you need to drop this class, you must complete a [Drop Request Form](https://www.tamuct.edu/registrar/docs/Drop_Request_Form.pdf) [[https://www.tamuct.edu/registrar/docs/Drop\\_Request\\_Form.pdf](https://www.tamuct.edu/registrar/docs/Drop_Request_Form.pdf)].

Professors cannot drop students; this is always the responsibility of the student. The Registrar's Office will provide a deadline on the University Calendar for which the form must be completed, signed and returned. Once you return the signed form to the Registrar's Office, you must go into Warrior Web and confirm that you are no longer enrolled. If you still show as enrolled, FOLLOW-UP with the Registrar's Office immediately. You are to attend class until the procedure is complete to avoid penalty for absence. Should you miss the drop deadline or fail to follow the procedure, you will receive an F in the course, which may affect your financial aid and/or VA educational benefits.

### Academic Integrity.

Texas A&M University -Central Texas values the integrity of the academic enterprise and strives for the highest standards of academic conduct. A&M-Central Texas expects its students, faculty, and staff to support the adherence to high standards of personal and scholarly conduct to preserve the honor and integrity of the creative community. Academic integrity is defined as a commitment to honesty, trust, fairness, respect, and responsibility. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing

grade for the course. Academic misconduct is any act that improperly affects a true and honest evaluation of a student's academic performance and includes, but is not limited to, cheating on an examination or other academic work, plagiarism and improper citation of sources, using another student's work, collusion, and the abuse of resource materials. All academic misconduct concerns will be reported to the university's Office of Student Conduct. Ignorance of the university's standards and expectations is never an excuse to act with a lack of integrity. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action.

### **Academic Accommodations.**

At Texas A&M University-Central Texas, we value an inclusive learning environment where every student has an equal chance to succeed and has the right to a barrier free education. The Department of Access and Inclusion is responsible for ensuring that students with a disability receive equal access to the University's programs, services and activities. If you believe you have a disability requiring reasonable accommodations please contact the Department of Access and Inclusion at (254) 501-5831. Any information you provide is private and confidential and will be treated as such.

For more information please visit our [Access & Inclusion](https://www.tamuct.edu/student-affairs/access-inclusion.html) webpage [https://www.tamuct.edu/student-affairs/access-inclusion.html].

Texas A&M University-Central Texas supports students who are pregnant and/or parenting. In accordance with requirements of Title IX and guidance from US Department of Education's Office of Civil Rights, the Dean of Student Affairs' Office can assist students who are pregnant and/or parenting in seeking accommodations related to pregnancy and/or parenting. For more information, please visit <https://www.tamuct.departments/index.php>. Students may also contact the institution's Title IX Coordinator. If you would like to read more about these [requirements and guidelines online](http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf), please visit the website [http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf].

### **Tutoring.**

Tutoring is available to all A&M-Central Texas students, both on-campus and online. On-campus subjects tutored include Accounting, Advanced Math, Biology, Finance, Statistics, Mathematics, and Study Skills. Tutors are available at the Tutoring Center in Warrior Hall, Suite 111. If you have a question regarding tutor schedules, need to schedule a tutoring session, are interested in becoming a tutor, or any other question, contact Academic Support Programs at 254-519-5796, or by emailing Larry Davis at [Imdavis@tamuct.edu](mailto:Imdavis@tamuct.edu).

Chat live with a tutor 24/7 for almost any subject on your computer! Tutor.com is an online tutoring platform that enables A&M-Central Texas students to log-in and receive FREE online tutoring and writing support. This tool provides tutoring in over forty subject areas. Access Tutor.com through Canvas.

**The University Writing Center.**

Located in 416 Warrior Hall, the University Writing Center (UWC) at Texas A&M University-Central Texas is a free workspace open to all TAMUCT students from 10am-5pm Monday-Thursday with satellite hours in the University Library on Mondays from 6:00-9:00pm. Students may arrange a one-on-one session with a trained and experienced writing tutor by visiting the UWC during normal operating hours (both half-hour and hour sessions are available) or by making an appointment via [WOnline](https://tamuct.mywconline.com/) [https://tamuct.mywconline.com/]. In addition, you can email Dr. Bruce Bowles Jr. at [bruce.bowles@tamuct.edu](mailto:bruce.bowles@tamuct.edu) to schedule an online tutoring session. Tutors are prepared to help writers of all levels and abilities at any stage of the writing process. While tutors will not write, edit, or grade papers, they will assist students in developing more effective composing practices. By providing a practice audience for students' ideas and writing, our tutors highlight the ways in which they read and interpret students' texts, offering guidance and support throughout the various stages of the writing process. In addition, students may work independently in the UWC by checking out a laptop that runs the Microsoft Office suite and connects to WIFI, or by consulting our resources on writing, including all of the relevant style guides. Whether you need help brainstorming ideas, organizing an essay, proofreading, understanding proper citation practices, or just want a quiet place to work, the University Writing Center is here to help!

If you have any questions about the University Writing Center, please do not hesitate to contact Dr. Bruce Bowles Jr. at [bruce.bowles@tamuct.edu](mailto:bruce.bowles@tamuct.edu).

**University Library.**

The University Library provides many services in support of research across campus and at a distance. We offer over 200 electronic databases containing approximately 250,000 eBooks and 82,000 journals, in addition to the 72,000 items in our print collection, which can be mailed to students who live more than 50 miles from campus. Research guides for each subject taught at A&M-Central Texas are available through our website to help students navigate these resources. On-campus, the library offers technology including cameras, laptops, microphones, webcams, and digital sound recorders.

Research assistance from a librarian is also available twenty-four hours a day through our online chat service, and at the reference desk when the library is open. Research sessions can be scheduled for more comprehensive assistance, and may take place on Skype or in-person at the library. Assistance may cover many topics, including how to find articles in peer-reviewed journals, how to cite resources, and how to piece together research for written assignments.

Our 27,000-square-foot facility on the A&M-Central Texas main campus includes student lounges, private study rooms, group work spaces, computer labs, family areas suitable for all ages, and many other features. Services such as interlibrary loan, TexShare, binding, and laminating are available. The library frequently offers workshops, tours, readings, and other events. For more information, please visit our [Library website](https://tamuct.libguides.com/) [https://tamuct.libguides.com/].

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## **OPTIONAL POLICY STATEMENTS:**

### **A Note about Sexual Violence at A&M-Central Texas**

Sexual violence is a serious safety, social justice, and public health issue. The university offers support for anyone struggling with these issues. University faculty are mandated reporters, so if someone discloses that they were sexually assaulted (or a victim of Domestic/Dating Violence or Stalking) while a student at A&M-Central Texas, faculty members are required to inform the Title IX Office. If you want to discuss any of these issues confidentially, you can do so through Counseling Services (254-501-5956) located on the second floor of Warrior Hall.

Sexual violence can occur on our campus because predators often feel emboldened, and victims often feel silenced or shamed. It is incumbent on ALL of us to find ways to actively create environments that tell predators we don't agree with their behaviors and tell survivors we will support them. Your actions matter. Don't be a bystander; be an agent of change. For additional information on campus policy and resources visit the [Title IX webpage](https://www.tamuct.edu/departments/compliance/titleix.php) [https://www.tamuct.edu/departments/compliance/titleix.php].

### **INSTRUCTOR POLICIES**

Students should come to class prepared, ready to ask questions and participate in discussions.

While in other classes, the direct quoting of other authors is considered acceptable; in this class, it is not acceptable. You may not directly quote any other published paper, web site, or textbook in any writing assignment, including papers, homework, discussion boards, PowerPoint presentations, or any other written assignments. The simple reason for this is that copying (quoting) is a lower level skill. However, reading, understanding, and then communicating the ideas in your own words is the high level skill that I want you to develop.

Please note that plagiarism, is a serious problem, and that any plagiarized assignment will result in a failing grade for this class.

Do not submit any code that is not yours. Do not copy code from websites, other students, tutors, friends, family, or from any other source that is not your brain. If you get help with any code, you must make it clear which portions of the code you had help with and which you wrote. You must supply the contact information for the person, web site, youtube video, or other person who helped you. This is very important because you will only learn to write code by writing code. Yes, some concepts are difficult, but if you do not write the code and solve the problems, you will not learn how to write code and solve problems. Having someone explain a solution or algorithm to you or help you debug a problem is acceptable and allowed. Having someone else write the code for you is not OK. Submitting someone else's code as your own will result in a failing grade for this class.

All late assignments will lose 30% of the available points before being graded. Late assignments will be graded at the professor's discretion.

All projects must have the author's name in every class and method submitted. (See Code Documentation Standards.) Every project submitted must be named starting with the student's

last name followed by the project number. All projects must be zipped using WinZip. The zipped file submitted must be named, starting with the student's last name. Projects that do not follow this naming and documentation standard will be returned ungraded.

Dr. Woodcock reserves the right to modify this syllabus during the semester.