

Midwestern State University

Department of Computer Science Spring 2021

Course Information

- **Title:** Data Structures & Abstract Data Types
- **Number:** CMPS 1063
- **Section:** 201
- **Hours:** Monday, Wednesday, Friday at 12:00PM-12:50PM
- **Location:** BO 320 (Bolin Hall, third floor)

Instructor Information

- **Name:** Jeremy Glebe
- **Office:** BO 126E
- **Email:** jeremy.glebe@msutexas.edu

Office Hours

- **Monday 10:00AM-11:50AM**
- **Tuesday 9:00AM-9:50AM**
- **Thursday 9:00AM-9:50AM**

Course Description

Introduction to data structures, abstract data types (ADT), recursion, and algorithm analysis using a high level language. Continuing development of a disciplined approach to program design, coding, debugging, and testing.

Textbook: Starting Out With C++, Early Objects

- **Authors:** Gaddis, Walters and Muganda
- **Edition:** Recommend 8th or higher.
- **The textbook is not required to pass the class, nor is it required to obtain assignments,** but it is useful and contains an immense amount of references and examples.

Software

Visual Studio is recommended and it is available to MSU students free of charge.

However, as we will not be studying any libraries specific to Visual C++ or Windows, students may use other tools if desired. On that note, students writing (or copying from online) obscure, compiler dependent code is discouraged and may impact grades.

Hardware

- **Students will need access to a computer** but there are some available in the labs if you do not have one.
- **If you do not have a computer of your own,** make sure to pay attention to the lab's hours! Lab hours will not be an excuse for late work.
- **If you are working from a personal computer,** you should know that chromebooks are not supported well by D2L/Brightspace.
- **Students should also have access to a printer and paper.** These are also available in several of MSU's computer labs. See above note on lab hours.

Communication

If I do not respond to an email within 24 hours, **email me again**. I'm a busy person, as I am also a full time student, but you have paid for my time! If I don't respond immediately, I probably just missed the email, send me a follow-up.

Grading

Grade Scale

Points Earned	Letter Grade
90-105	A
80-89.9	B
70-79.9	C
60-69.9	D
0-59.9	F

Points Value of Assignment Categories

Category	Total Points Earnable
Quizzes & Minor Programs	40
Exams & Major Programs	40
Final Exam	20
Extra Credit & Participation	5

Important Grading Note! It is critical that students turn in *every Major Program*. Students who fail to submit 2 or more Major Programs will receive a failing grade in the course, regardless of other scores.

Extra Credit

- There will be multiple opportunities to earn extra credit during the semester. These opportunities may be events, such as ACM meetings, or additional assignments.
- Each extra credit opportunity will earn 1 point for the student's extra credit & participation grade
- A maximum of 5 points can be earned for extra credit and participation
- A point for participation may be earned in class for student's overall contributions and efforts. This will be determined at the end of the semester.
- Extra credit and participation grades serve as a method to "round" your grade. If you have an 85, extra credit could be the difference between a B and an A.

Attendance Policy

- Attendance is not a component of the course grade.
- The student will be subject to any attendance requirements specified by the department or university.
- Students are responsible for material or assignments that they miss.
- Exceptions will be provided with university excused absences and may be otherwise provided by the instructor with reasonable documentation.
- It is impossible to earn participation credit if a student is not present, meaning that attendance may have an indirect impact on a student's final grade.

Programming Assignments

For all programming assignments, but especially Major Programs, I expect:

- Programs must always compile. Students have access to compilers on lab computers, there is no excuse for this.

- Programs must not crash on reasonable inputs. I'm not demanding a bug-free program, only that I can run enough of it to grade without crashing.

Failure to meet these conditions will result in severe grade penalties. (20% minimum) A few pieces of advice:

1. If your program is not compiling, you can always ask the instructor or tutors for help.
2. Even if your program is incomplete in terms of features, make sure it runs! I'll give partial credit for incomplete programs, but they still need to compile and run.
3. It is better to turn in an assignment 1 or 2 days late than to give me a program which does not compile.

Final Exam

- Our final exam will be Wednesday, April 28th at 3:30PM-5:30PM in our regular classroom.
- There will not be an opportunity to make up the final exam. **Do not miss it.**
- In the event of a university excused absence, the student's final grade will be calculated from their current average.
- [Click here for the university final exam schedule.](#)

Late Work Policy

- Late work will be accepted for up to a week after an assignment is due or at the instructor's discretion.
- Assignments turned in late incur a 10% penalty immediately. For each additional day the assignment is not turned in, it will incur a 5% penalty.

Department Policies

Policy on Academic Honesty

The Department of Computer Science had adopted the following policy related to cheating (academic misconduct). The policy will be applied to all instances of cheating on assignments and exams as determined by the instructor of the course.

- 1st instance of cheating in a course: The student will be assigned a non-replaceable grade of zero for the assignment, project or exam. In addition, the student will receive a one letter grade reduction in course.
- 2nd instance of cheating in a course: The student will receive a grade of F in course & immediately be removed from course.
- All instances of cheating will be reported to the Department Chair and, in the case of graduate students, to the Department Graduate Coordinator.

Testing Policy

The Department of Computer Science has adopted the following policy related to testing.

- a. All bags, purses, electronics (turned off), books, etc. will be placed in the front of the room during exams, or in an area designated by the instructor.
- b. Unless otherwise announced by the instructor, nothing is allowed on the desk but pen/pencil/eraser and test papers.
- c. You are not allowed to leave the classroom. Please take this seriously and into consideration before any test and the final. Prepare yourself to be in the classroom during the entire exam.
- d. If you decide to leave the classroom during a test and/or the final exam, your exam will be collected, and you will not be allowed to continue.

University Policies

Classroom Civility

All violations of classroom civility will be reported to the Dean of Students. Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to ensure that all students gain from time spent in class, students are prohibited from engaging in any form of distraction, e.g. leaving the room for extended periods of time, reading newspapers (or other articles), working on other courses, and using cell-phones or laptops for calls or messages. If you indulge

in any such inappropriate behavior (without explicit consent of the instructor), you will (at the very least) be asked to leave the classroom. [MSU Dean of Students Website](#).

Students with Disabilities

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from disability support office during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Disability Support Office has been provided. For additional information you may contact the Disability Support Office in Clark Student Center 168 -Phone: (940) 397-4140. [Disability Support Services](#).

Dean of Students

The Dean of Students can assist in notifying the campus community of student illnesses, immediate family deaths and/or student death. Generally, in cases of student illness or immediate family deaths, the notification to the appropriate campus community members occur when a student is absent from class for four consecutive days with appropriate verification. It is the student's responsibility for missed class assignments and/or course work during their absence. [MSU Dean of Students Website](#).

Campus Carry

Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage at [Campus Carry](#).

University COVID-19 Policy

All members of the MSU Texas Community (students, faculty, staff, visitors, vendors and contractors) are required to wear protective face coverings on campus or in University facilities as provided below:

I. Requirements

- a. In common areas on campus including, but not limited to, classrooms and other spaces used for teaching, research, and creative activity, student center, library, hallways, elevators, stairwells, restrooms, break rooms, foyers, event rooms and lobbies;
- b. Other areas where physical distancing of at least 6 feet is not maintained. Even when physical distancing of at least 6 feet can be maintained, face coverings are strongly recommended.

II. Exceptions

- a. When eating or drinking, which should still be conducted maintaining physical distance;
- b. In accordance with applicable law(e.g., an accommodation, including for medical reasons, under the Americans with Disabilities Act (ADA), or pursuant to a bona fide religious belief)
- c. For children under the age of 2 years old; or
- d. By an instructor/presenter in a classroom or event room when a physical distance of at least 10 feet can be maintained from the class members/audience

Recording of Class Lectures

Permission must be requested in writing and obtained from the instructor before recording of class lectures. If permission is granted, the recording may only be used by the student making the recording. Recordings (or any class materials) may NOT be posted on any internet source without written permission of the instructor. Failure to adhere to the policy may result in removal from the course with a grade of F or other appropriate punishment.

Midterm Progress Report

In order to help students keep track of their progress toward course objectives, the instructor for this class will provide a Midterm Progress Report for all students in the course through each student's WebWorld account. Midterm grades will not be reported on the students' transcript; nor will they be calculated in the cumulative GPA. They simply give students an idea of where they stand at the midpoint of the semester. Students earning below a C at the midway point should a) schedule a meeting with the professor and b) Seek out tutoring.

Important Dates

Visit MSU's Registrars website Important Dates https://msutexas.edu/registrar/_assets/files/pdfs/fall19front.pdf.

Course Topics Listing

Core Topics

- Review of Computer Science I
 - Functions
 - 2D Arrays
- Structures (records, "heterogeneous aggregates")
 - C++ structs
 - Arrays of records/structs
 - Records/structs containing arrays
 - Records/structs as return types
- Pointers
 - Dynamic Memory Allocation
 - Function Parameters (pass by value, reference, pointer)
- Strings & String Operations
- Classes & Objects
 - Properties/Data Members
 - Access Modifiers
 - Methods/Member Functions
 - Constructors/Destructors
 - Overloaded Methods
 - Classes vs Structs
 - Differences (or lack thereof)
 - Objects vs Records
 - C Structs and "Why the redundancy?"
- Abstract Data Types
 - What is an ADT?
 - Conceptual Lists, Stacks, Queues
- Linked List Implementation
 - Operations
 - Single, double, circular
- Stack Implementation
 - Array-based
 - List-based
- Queue Implementation
 - Array-based
 - List-based
- Searching, Sorting, Algorithm Analysis
 - Searching & Sorting Arrays
 - Big-O
 - Growth Rates & Growth Functions
 - $O(n^2)$ Sort Algorithms
- Recursion
 - Inductive Reasoning (overview, no proofs)
 - Divide and Conquer Paradigm
 - Quick Sort
 - Merge Sort
 - Recursion Vs. Iteration
 - Nodes as Lists (recursive methods)

Additional Topics (time permitting)

- Binary Trees

- Binary Search Trees
 - Balanced BSTs (concept & purpose only)
- STL Data Structures (usage & concept, no implementation)
 - Vectors
 - Sets
 - Maps