

SYLLABUS

Number and Title of Course: CMPS1063– Data Structures and ADTs

Catalog Description of Course: A continuation of the development of a disciplined approach to the design, coding, debugging, and testing of programs. Introduction to data structures, abstract data types (ADT), recursion, and algorithm analysis using a high-level language.

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Office Hours: M-F 11-noon, TR 2-3pm & by appt

More Description: This course, although continuing to introduce features of the C++ programming language, develops the student's ability to design and implement well-structured and correct programs using the object-oriented paradigm. The course introduces elementary data structures (lists, linked lists, stacks, queues and trees) with emphasis on their implementation using arrays and pointers and recursive algorithms. The concepts of encapsulation and information hiding in object-oriented programming will be studied.

Course Prerequisite: Minimum grades of C in CMPS 1044 and MATH 1233 or MATH 1534.

Required Textbook and Materials

- Starting out with C++ Early Objects, 10th edition, by Gaddis, Walters and Muganda
- Supplementary material and lecture notes.
- 1 USB memory stick

General Objectives

- Further develop the student's ability to analyze problems and translate that analysis into a computer program using proper software engineering techniques;
- Introduce a mathematically based analysis of algorithms;
- Develop an understanding and appreciation of recursion as a basic style of programming;
- Introduce and analyze algorithms for internal sorting and searching;
- Introduce and analyze the important data structures of computer science as well as various ways of implementing them;
- Develop the ability of students to solve large, complex problems.

Specific Objectives

- Develop solutions to programming problems using objects and the C++ language
- Use and analyze searching, sorting and recursive algorithms
- Implement the data structures: lists, stacks, and queues to solve problems
- Understand the software engineering methodology and be able to apply it to solving large complex problems

Instructional Methods and Techniques

- The class will meet for two lecture/discussion periods each week.
- Some lectures may be supplemented with handouts and web materials to allow students access to information.

Assignments

- Three exams and a comprehensive Final Exam over the lectures and readings.
- Homework, quizzes and mandatory in-class work on material discussed in class.
- Programming assignments

Exams and Assignments: There will be three tests and one comprehensive final exam. Exams cover material from the text as well as handouts. The lectures may not cover all the material in the textbooks. There will be several major programming projects as well as a few small assignments. The projects will be expected to be complete and robust, including good user interfaces and the ability to handle improper input. Industry level internal and external documentation will also be expected.

Course Evaluation:

Programming projects	= 450 pts.
Homework assignments / quizzes / in class work	= 100 pts.
3 tests	= 300 pts.
1 FINAL EXAM	= 150 pts.

Grades may be determined according to this scale (approximate):

A	90% - 100%	B	80% - 89%
C	65% - 79%	D	55% - 64%

Course and Department Policies:

Attendance Policy: Although student attendance is not calculated into the grade, attendance will be taken each day to track students. If a student is absent more than 3 classes without a documented excuse and is not performing well in class, a report will be submitted to the Dean of Students and the student may be dropped from the class. Classes will not be streamed for absent students, whether it is excused or not.

Behavior in the classroom: Students are expected to assist in maintaining a classroom environment that is conducive to learning. This means that the presence of electronic devices other than your calculator are not to be seen, heard, or implied, ever. Questions are encouraged and discussion is acceptable, provided it is pertinent and does not distract from the lesson.

Late Work: Late programs will be accepted up to 5 days late with a 10 point deduction per day. *No late programs for last programming assignment.*

Make Up Work/Exams/Quizzes: Students need a valid university excuse (e.g., excuse from the doctor, death in the immediate family, etc.) to make up work or tests.

- For planned *excused* absences: Exam/Quiz may be taken early by prior arrangement.
- For unplanned *excused* absences: Student must make up a missed exam within 4 working days. All other missed exams will receive a zero.

Computer Requirements: Taking this class requires you to have access to a computer (with Internet access) to complete and upload your assignments. It is your responsibility to have (or have access to) a working computer in this class. Personal computer technical difficulties will not be considered a reason for extra time to submit assignments, tests, or online discussion postings. Online class material can be accessed from any computer in the world which is connected to the internet. Computers are available on campus in various areas of the buildings, as well as the Academic Success Center. Contact your instructor immediately upon having computer trouble. If you have technical difficulties in the course, there is also a student helpdesk available to you. The university cannot work directly on student computers due to both liability and resource limitations, however they are able to help you get connected to our online services. For help, log into [D2L](#).

Policy on Testing Process:

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

- 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.
- Unless otherwise announced by the instructor, nothing is allowed on the desk but pen/pencil/eraser and test papers.
- A student who leaves the room during an exam must turn in the test and will not be allowed to return.

Policy on Programs

- Tests will have questions covering out-of-class assignments. Know the material!
- Students will be invited to orally answer questions regarding their assignments in my office and failure to answer those questions correctly will result in deductions from their grades. (Every student can expect to be invited 1-2 times during the semester to answer questions.)

Computer Science Tutoring

Tutoring is available in the **Office of Tutoring and Academic Support Programs (TASP)** in Moffett Library. A tutor may assist with programs and homework for computer science classes. The tutor will not do your work. NOTE: Any tutor who is also in this class, may not assist with programs and homework. You must seek out a different tutor.

Academic Misconduct Policy & Procedures

Academic misconduct is cheating, collusion, and plagiarism: it is the act of using either published or unpublished source material of other students, persons, or generative AI (unless there are instructions that allow it), and must follow accepted techniques of crediting. The Department of Computer Science has adopted the following policy related to academic misconduct. The policy will be applied to all submission of work for credit as determined by the instructor of the course, e.g., assignments, quizzes and exams. (See below for link to MSU definitions.)

- *1st instance* of cheating in the program: The student will be assigned a non-replaceable grade of zero for the assignment, project or exam. If the final grade in the course, does not result in a one letter grade reduction, the student will receive a one letter grade reduction in course.
- *Further instances* of cheating in any course within the program: The student will receive a grade of F in the course & be removed from the course.
- All instances of cheating will be reported to the Department Chair, the MCOSME Dean, the Dean of Graduate Students, if a graduate student, and the Office of Rights and Responsibilities, who may decide at their own discretion to impose a stiffer sanction based on knowledge of other instances of cheating at MSU Texas.

Note: Letting a student look at your work is collusion and is academic misconduct!

See Also: [MSU Student Handbook](#): Appendix E: Academic Misconduct Policy & Procedures

https://msutexas.edu/student-life/_assets/files/handbook.pdf.

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.

University Policies and Procedures

Student 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, contact the Disability Support Office in Clark Student Center 168 - Phone: (940) 397-4140

Policy on Concealed Handguns on Campus:

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 [MSU Campus Carry Policy](#) or <https://msutexas.edu/campus-carry/rules-policies>. If you have questions or concerns, please contact MSU Chief of Police Steven Callarman at Steven.callarman@msutexas.edu.

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 MSU Portal 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/fall24front.pdf) at msutexas.edu/registrar/_assets/files/pdfs/fall24front.pdf

CMPS 1063 – TENTATIVE SCHEDULE OF TOPICS

Week	Chapter	Topic	Assignment
1		Introduction	
	6	Review Functions	Program 1 (2D array)
	8	Review Arrays	Function HW due
***** Labor Day, Sept. 4 *****			
2	7.12	Structs	
	7	Abstract Data Types	Array HW due
3	7	Classes and Objects	Program 1 Due
4	7	Classes and Objects In class Assignment	Program 2 (Classes and Objects) Class-Object HW due
5		Examination 1 (Chpts 6, 7, 8)	
	9	Searching Arrays	
6	9	Sorting Arrays Searching QZ / Sorting QZ	Program 2 due
7	10	Pointers & Dynamic Memory	Pointer HW due Program 3 (Pointers)
8	10	Recursion	Recursion QZ
9	14	Recursion Program 3 Due Program 4 (Recursion)	Recursion HW Due
10		In class Assignment Examination 2 (Chpts. 9, 10, 14)	Program 4 due
	18	Linked Lists	Program 5 (Linked Lists)
11	18	Linked Lists Operations	
12	18/19	More Linked Lists Stacks and Queues	Linked List HW due
13	19	Stacks and Queues Program 6 (Stacks and/or Queues)	Program 5 due
***** THANKSGIVING, Nov. 22-24*****			
14	19	Stacks and Queues	Stacks HW due
	12	Strings	Queues HW due
15		In class Assignment Examination 3 (Chpts 17, 12) FINAL REVIEW	String QZ Program 6 due
16		FINAL EXAMINATION: Monday, Dec. 11, 8-10am	