COMPUTER SCIENCE & ENGINEERING
TEXAS A&M UNIVERSITY

CSCE 221: Data Structures and Algorithms

Sections 501,503, 509, 510 / Fall 2018
Credits 4. 3 Lecture Hours. 2 Lab Hours.

Lecture Place and Time

501 & 503: ZACH 350 / MWF, 12:40 pm - 01:30 pm
509 & 510: ZACH 340 / MWF, 10:20 am - 11:10 pm

Lab Place and Time

501: ZACH 445 / MW, 11:30 am - 12:20 pm
503: ZACH 312 / MW, 01:50 pm - 02:40 pm
509: RDMC 111H / MW, 08:00 am - 08:50 am
510: RDMC 111H / MW, 11:30 am - 12:20 pm

Course Description

Specification and implementation of basic abstract data types and their associated algorithms including stacks, queues, lists, sorting and selection, searching, graphs, and hashing; performance tradeoffs of different implementations and asymptotic analysis of running time and memory usage; includes the execution of student programs written in C++.(from CSCE Course Description)

Prerequisites/Co-requisites

Prerequisite: CSCE 121 (*Introduction to Program Design and Concepts)* or CSCE 113 (*Intermediate Programming & Design*).

Co-requisite: CSCE 222 / ECEN 222 (*Discrete Structures for Computing*) or MATH 302 (*Discrete Mathematics*), either may be taken concurrently with CSCE 221.

Learning Objectives

1. Provide students with knowledge of basic abstract data types and associated algorithms for stacks, queues, lists, trees, graphs, hash tables, and priority queues.
2. Provide students with C++ programming practice by specifying and implementing data structures and algorithms.
3. Provide students with skills needed to understand and analyze complexity of algorithms focus on run time performance and memory usage.

Expected Learning Outcomes

At the end of this course, students should be able to

1. Design and implement different data structures that allow easy access and manipulation of data using the C++ programming language.
2. Apply the Big-O asymptotic notation to analyze and select efficient algorithms for solving a given problem with respect to time and memory usage.

Instructor

Dr. Eduardo F. Nakamura
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Phone: 979-862-1165
Office Hours: MTW, 2:00 pm - 3:00 pm (or by appointment)

Teaching Assistant

Binbin Li (sections 501& 503)
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Office Hours: TR, 10:00 am - 12:00 pm

Harish Kumar (sections 509 & 510)
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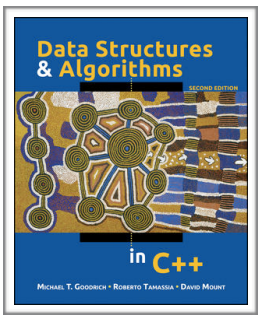
Office Hours: TR, 12:00 pm - 01:00 pm

Peer Teachers

Peer teachers at HRBB 129 can also help you with most of your questions.

Textbook



Data Structures and Algorithms in C++, by M. T. Goodrich, R. Tamassia, and D. Mount, 2nd ed., 2011, Wiley, ISBN 13-978-0-470-38327-8.

(*Any C++ reference book may be helpful as well.*)

Course Content and Tentative Schedule

This is a tentative plan that can be modified due to the students learning pace or unpredictable events.

Week	Content	Book Chapter
Aug. 27	Introduction/Analysis of Algorithms	ch. 4
Sep. 03	Analysis of Algorithms	ch. 4
Sep. 10	Stacks, Queues, and Deques	ch. 5
Sep. 17	Vectors, Lists, and Sequences	ch. 6
Sep. 24	Trees	ch. 7
Oct. 01	Priority Queues & Heaps	ch. 8
Oct. 08	Warm-up and Midterm Exam	-
Oct. 15	Maps, Dictionaries	ch. 9
Oct. 22	Hashing, SkipLists	ch. 9
Oct. 29	Binary Search Trees	ch. 10
Nov. 05	Sorting and Selection	ch. 11
Nov. 12	Graphs part I	ch. 13
Nov. 19	Graphs part II	ch. 13
Nov. 30	Graphs part II, Exam Warm-Up	ch. 13

Grading Criteria

The overall grade will be determined as follows:

Criterion	%
Labs	5%
Homework Assignments	10%
Cultural Assignments	5%
Programming Assignments	30%
Quizzes	10%
Midterm Exam	20%
Final Exam	20%

Grading Scale				
90-100	80-89	70-79	60-69	0-59
A	B	C	D	F

Labs will be graded **based on attendance and engagement**. There should be **five homework assignments**, **five programming assignments**, and **ten quizzes**. Quizzes will be randomly applied during the semester.

Depending on the final percentage distribution, an absolute or relative curve may be applied (**an attempt will be made to avoid this situation**).

The instructor reserves the right to raise grades near a *borderline* to the next highest letter grade. This decision will be based on the student's perceived effort, class attendance and participation.

All programs must be written in C++, compiled and run on a CS departmental computer.

All assignments should be submitted to eCampus and a hard copy must be provided to the TA with the signed cover sheet within one day (must be typed).

Each assignment will be graded focusing on: algorithm design, usage of data structures and new user-defined types and quality of implementation, organization, correctness, a typed report describing implemented algorithms and data structures, and results of experiments.

Computer Science Account

You need a Computer Science account to use any of the CS computing resources, which includes the labs, UNIX, printing, email, and web resources, see the Getting Started Guide.

Important Dates

Sections 501 & 503:

- Midterm Exam: Oct. 15, 12:40 pm - 01:30 pm
- Final Exam: Dec. 10, 10:30 am - 12:30 pm

Sections 509 & 510:

- Midterm Exam: Oct. 15, 10:20 am - 11:10 pm
- Final Exam: Dec. 11, 08:00 am - 10:00 am

Polices

1. **Attendance**: Attendance is strongly suggested. It will not be checked, but it might be considered in borderline decisions for the final grade. Students with unexcused absences should not expect additional help outside of class and are still responsible for any material or instructions given in class, for turning in assignments on time, and for taking exams at the scheduled times. University excused absences will be handled in accordance with the Texas A&M student rule 7.
2. **Make Up**: Missed exams will only be rescheduled for excused absences. If advanced notice is not feasible, you have two working days provide me notification (see Texas A&M student rule 7). A zero will be assigned for exams due to an unexcused absence. Documentation must be submitted prior to taking a missed exam.
3. **Late Assignments**: Assignments are due at 11:59pm on the given due date. Assignments turned in after that time will be considered late. The percentage penalty applied to each late assignment will be calculated as follows: let *m* be the number of minutes late, the **percentage penalty** is *m*/57.6. Therefore, an assignment 24 hours late will receive 25% off of the grade assigned without any penalty, and an assignment 4 days late will receive no credit. Certain assignments may not be allowed to be turned in late.
4. **Communication**: A class web page will be created and maintained throughout the semester. Students are responsible for checking the eCampus, the web page and email regularly for class updates.
5. **Reading**: Readings from the textbook will be given out throughout the semester. We will not be able to discuss all of it in class, but you are still responsible for keeping up with these readings.
6. **Code Documentation**: When assignments are graded, source code may be examined to verify the way a solution was achieved or to award partial credit. It is your responsibility to make sure that your source code is presented in a clear, readable, way. Even if your code works, if the grader cannot understand it, you may lose points.

Academic Integrity Statement and Policy

The Aggie Honor Code is:

> *An Aggie does not lie, cheat, or steal or tolerate those who do.*

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System.

Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. For additional information visit the Aggie Honor System Office page.

For this class, the interpretation of the code will be as follows:

1. All assignments must be done on your own. You may discuss concepts, and get help in tracking down a persistent bug, but should not copy work, download code from the web or other sources, or work together with other students on problems or programs unless specifically stated otherwise.
2. If you use sources other than the textbook or lecture notes, list them in a homework Cover page.
3. You must write up your assignments in your own words.
4. Copying is strictly forbidden.

By turning in an assignment or exam, you are implicitly assumed to be committing to the honor code. If you are unsure of whether a type of cooperation is appropriate, check with the instructor or TA first. That is, you should err on the side of assuming cooperation is not allowed.

If, in the opinion of the instructor, any homework shows evidence of copying, the student(s) will receive at minimum a zero on the assignment and be placed on honor council probation. The penalty could escalate to expulsion from the university.

Americans with Disabilities Act (ADA) Policy Statement

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 contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit the Disability Services page.