CSCE 4133/5133
Algorithms

Class Overview

Fall 2024

Prof. Khoa Luu
khoaluu@uark.edu

Class Info

- Place (In-person): **First Security Aud WJWH0218**

- Course Website: http://csce.uark.edu/~khoaluu/CSCE4133.htm

- Communication: **In-Person/Course Website/Email**

Class Info

- Instructor: Prof. **Khoa Luu**
  Homepage: http://csce.uark.edu/~khoaluu/
  Email: khoaluu@uark.edu

- Co-Instructor: **Thanh-Dat Truong**
  Homepage: https://truongthanhdat.github.io/
  Email: tt032@uark.edu

- TAs/GAs:
  Tamanna Nazmin (Email: tnazmin@uark.edu)
  Manuel Serna-Aguilera (Email: mserna@uark.edu)

Remote Lecture

Blackboard Collaborate Ultra

(Only with Permission)

Class Info

- Time: **Mon-Wed-Fri, 8:35 AM - 9:25 AM**

- Office hours: Wed, 10:00 AM - 10:30 AM

- Office Location (JBHT 521) or MS Teams
  (by appointment)

Course Requirements

- Submission Place: Blackboard
- Five to six Quizzes
- Four Assignments
- Midterm Exam
- Final Exam
- Note: CSCE4133 and CSCE5133 will be slightly different

Course Requirements

- Reports:
  - Google Doc or
  - AAAI template (Latex) (Link)

Textbook

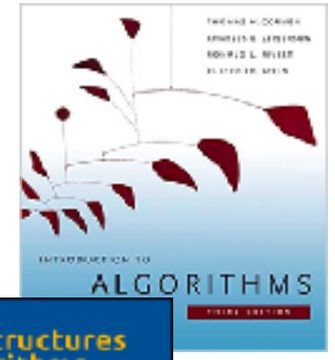
- Most important materials will be covered in slides/lectures

- There's no perfect textbook for this class, but there are some relevant books:

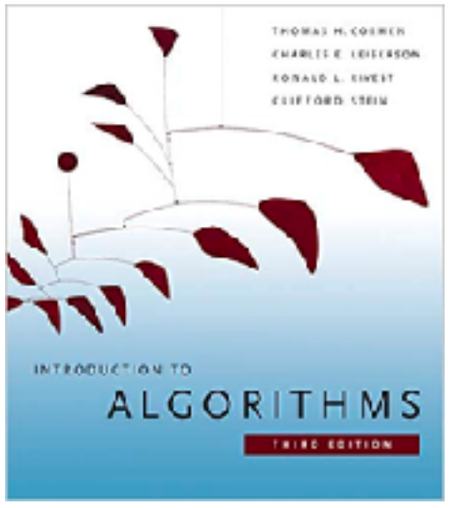
- **Introduction to Algorithms**, 3rd Edition (The MIT Press) by Thomas H. Cormen

- **Data Structures and Algorithms in C++**, 2nd Edition by Michael T. Goodrich

- **Cracking the Coding Interview** by G. McDowell

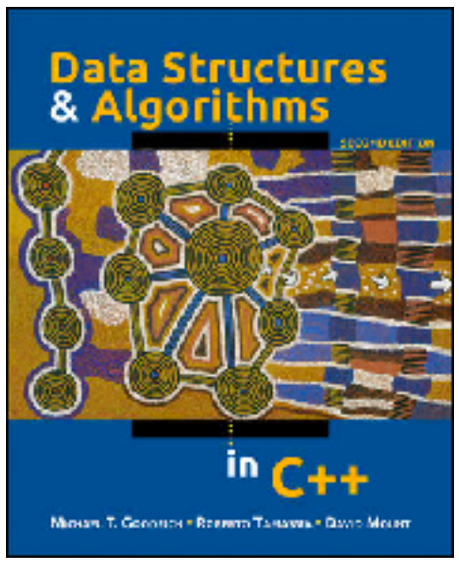


Textbook



- **Introduction to Algorithms**, 3rd Edition (The MIT Press)
  by Thomas H. Cormen (Link)

Textbook



- **Data Structures and Algorithms in C++**, 2nd Edition
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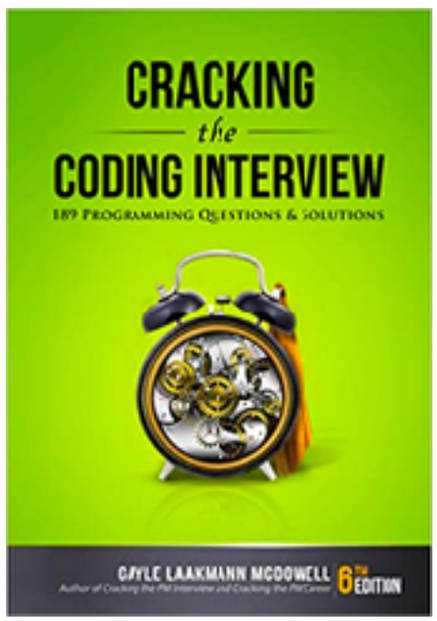
Textbook



- **Cracking the Coding Interview**
  by G. McDowell (Link)

Programming Languages

- C++ (Mainly)
- Python

Programming Languages

- Some tutorials/lectures will be included to review the programming with Algorithms
- Students are required to have a background in Programming Foundations I & II

Grading

The grading in this course will be distributed as follow

- Participation: 2%
- Assignments + Quizzes: 55%
- Midterm: 23%
- Final: 20%

Participation

Based on

- Attention in class
- Quizzes
- Questions/Answers in Class Forum
- Email communication

Approach

- Grading based on absolute scale
- Getting an A v.s mastering the materials
- Take advantage of extra credits
- Build your resume with meaningful project experience

Late Days

- FIVE late days in total (except for midterm exam, quizzes & final exam)
- Any additional late days will each incur a 30% penalty
- 3 days per assignment/project maximum use
- Use them wisely (save them for the last ones)

Learning Objectives

- Study, analyze, and implement complex data structures and associated algorithms

- Empirically evaluate implemented algorithms in various problems

- Develop useful classes or software components using algorithms and data structures

- Understand recent algorithms in AI and advanced Machine Learning

Pre-requisites

(CSCE 3193 or CSCE 3193H or DASC 2103, each with a grade of C or better)

and

(MATH 2603 or MATH 2803)

Please see the instructors if you are unsure whether your background is suitable for the course.

Related Courses

CSCE 4263/5183 Advanced Data Structures, Spring 2022 (CSCE, UA)

CSCE 2014: Programming Foundations II (CSCE, UA)

Major Topics In This Course (15w)

(Subject to change)

1. Introduction
2. Data Structures Review (Linked List, Stack, Queue, etc.)
3. Searching
4. Sorting
5. Trees/Binary Trees
6. Hashing
7. Huffman Coding Trees
8. Graphs
9. Strings
10. Algorithm Designs
11. Applications

Disability Accommodations

If you have a disability and have an accommodations letter from the Disability Resources office, we encourage you to discuss your accommodations and needs with us as early in the semester as possible.

We will work with you to ensure that accommodations are provided as appropriate.

If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources, we encourage you to contact them at

Academic Integrity

- Strict honor code with severe punishment for violators. UA's academic integrity policy can be found here: https://honesty.uark.edu/policy/

- You may discuss assignments with other students as you work through them, but writeups must be done alone.

- No downloading / copying of code or other answers is allowed.

- If you use a string of at least 5 words from some source, you must cite the source

Student Well-Being

- Start early! Avoid last-minute panic.
- UA services and resources are available, and treatment does work

  https://registrar.ua.edu/student-services/
- Take care of yourself