

# **CSCE 4263**

## **Advanced Data Structures**

# **Class Overview**

Fall 2025

Prof. Khoa Luu  
[khoaluu@uark.edu](mailto:khoaluu@uark.edu)

# Class Info

- Place (In-person): **JBHT 239 Classroom**
- Course Website:  
<https://uark-cviu.github.io/classes/csce4263/>
- Communication: **In-Person & MS Teams**

# Class Info

- Instructor: **Prof. Khoa Luu**  
<https://uark-cviu.github.io/>  
  
Email: [khoaluu@uark.edu](mailto:khoaluu@uark.edu)
- Co-Instructor: **Dr. Thanh-Dat Truong**  
<https://truongthanhdat.github.io/>  
  
Email: [tt032@uark.edu](mailto:tt032@uark.edu)
- Lecture: **In Class**

# Class Info

- Time: **Tuesdays - Thursdays, 8:00 AM - 9:15 AM**
- Office hours: Tuesdays, 11 a.m - noon
- Office Location: MS Team (by appointment)

# Course Requirements

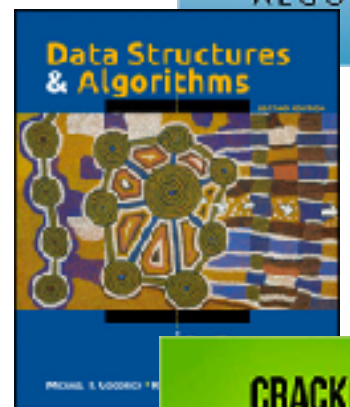
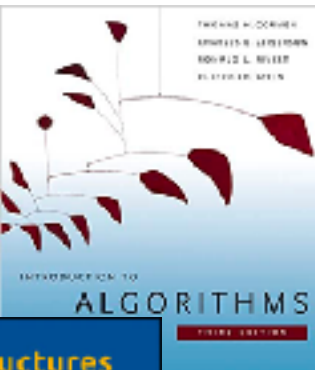
- Submission Place: Blackboard
- Five: Assignments + Quizzes
- Midterm Exam
- Final Project

# Course Requirements

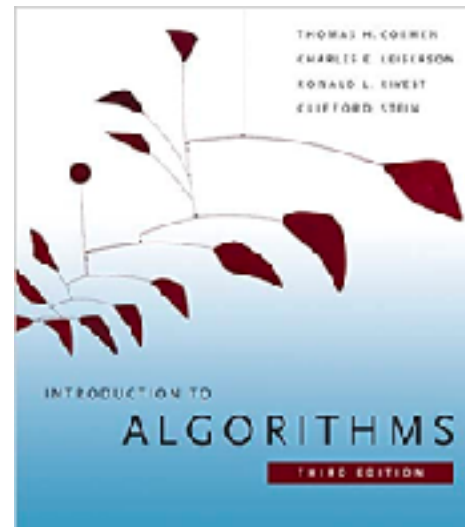
- Reports:
  - Google Doc or
  - AAI template (Latex)  
<https://aaai.org/Conferences/AAAI-20/aaai20call/>

# 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 ([Link](#))
- **Data Structures and Algorithms in C++**, 2nd Edition by Michael T. Goodrich ([Link](#))
- **Cracking the Coding Interview** by G. McDowell ([Link](#))



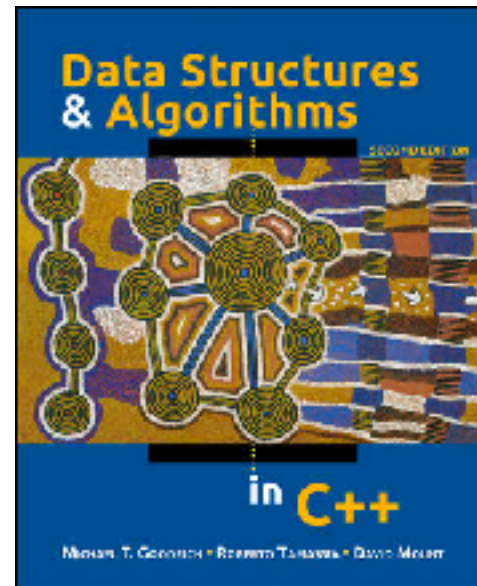
# Textbook



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



# Textbook



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

# Textbook



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

# Programming Languages

- C++ (Mainly)
- Python

# Programming Languages

- Some tutorials/lectures will be included to review the programming with Data Structures

# Grading

The grading in this course will be distributed as follow

- Participation: 2%
- Assignments + Quizzes: 50%
- Midterm: 25%
- Final: 25%

# Participation

Based on

- Attention in class
- 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

- 5 late days in total (except for midterm exam, quizzes & final projects)
- 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 data structures with very large data set
- Develop useful classes or software components using advanced data structures
- Understand recent data structures in Deep Learning and Machine Learning

# Pre-requisites

CSCE 3193 or CSCE 3193H

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

# Major Topics In This Course (15w)

(Subject to change)

1. Introduction (1 Week)
2. Reviews (Link List, OOP, Binary Tree, BT Search) (1 Week)
3. Self-balancing Binary Search Tree (AVL, Red-Black) (2 Weeks)
4. Splay Tree (1 Week)
5. Balanced Search Tree Review (2 Weeks)
6. Heap Methods (2 Weeks)
7. Hashing Methods (2 Weeks)
8. Data Structures in Deep Learning (1 Weeks)
9. Graph and Graph CNN (2 Weeks)
10. Final Project Presentations (1 Week)

# 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