

Department of Computer Science and Cybersecurity
College of Health, Science, and Technology
University of Central Missouri
Course Syllabus Fall 2023
CS 5300-Advanced Algorithms

Course: CS 5300

Office: MIC D257

Office Hours: 11:15 - 12:00 MW & 11:15 – 1:00 TR

Email: yousef@ucmo.edu

Meeting Time: 8:30 - 11:10 R MIC B201

to face and 50% Online

Zoom Information: Here is the zoom link for the online portion of the class:

Instructor: Dr. Mahmoud Yousef

Phone Number: (660)543-8892

Delivery Format: Hybrid 50% face

Join Zoom Meeting

<https://ucmo.zoom.us/j/93178786120?pwd=eXpySkhubWlrckxIZU9RbXBzVC9Ldz09>

Meeting ID: 931 7878 6120

Passcode: 863515

Textbook: 1. Foundations of Algorithms, Fifth Edition, Richard E. Neapolitan, Jones & Bartlett Learning 2015

2. Introduction to Algorithms 4th edition, by Cormen, Leiserson, Rivest, and Stein, PENG RAND, 2022.

Objectives and Desired Student Competencies: Upon completion of this course the student should be able to:

- Analyze worst-case and average-case running times of algorithms using asymptotic analysis.
- Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
- Describe and analyze dynamic-programming algorithms.
- Describe and analyze greedy algorithms.
- Describe and analyze backtracking algorithms.
- Explain the major graph algorithms and their analyses.
- Compare algorithms using established analysis techniques
- Understand the notions of class P and class NP problems

Students Learning Outcomes:

- Apply algorithmic principles and computing theories to solve advanced problems in Computer Science.
- Apply design and development principles in construction of computer-based systems of varying complexity.

Prerequisite: CS 4300 or consent of the instructor

Tests (200 pts.): There will be two tests, a midterm, and a comprehensive final. The midterm is worth 100 points, and it will be on October 5, 2023. The final exam is worth 100 points, and it will be held on Thursday, December 7, 2023. Make-up tests will be given only for absences determined by the instructor to be acceptable. Scheduling of the make-up test is the student's responsibility.

Homework (100 pts.): Homework will be given throughout the semester. All of the homework will be worth 100 points. **NO LATE HOMEWORK WILL BE ACCEPTED.**

Grading Scale: The grading scale is as follows:

A: 90%-100%, B: 80%-89.9%, C: 70%-79.9%, D: 60%-69.9%, F: 0%-59.9%

Accessibility Services

Students with disabilities who are seeking accommodation should contact the Office of Accessibility Services at Union 222, 660-543-4421. If you want to share information about your needs that I should be aware of, such as emergency medical information or special arrangements for field trips or internships, please see me privately after class or during office hours.

Sexual Discrimination and Sexual Misconduct Statement

The University of Central Missouri seeks to foster a safe and healthy environment built on mutual respect and trust. Sex discrimination, including sexual harassment, sexual violence, and other forms of sexual misconduct will not be tolerated. All faculty and most staff are considered mandated reporters by the University and must disclose all information they receive about sexual misconduct to the Title IX Coordinator. As a faculty or staff member of the University, I am a mandated reporter. This means I am required to report information shared with me regarding sex discrimination and sexual misconduct.

If you, or someone you know, has experienced sex discrimination or sexual misconduct, please know assistance and options are available. UCM strongly encourages all members of the community to seek support and report incidents of this nature to the Title IX Coordinator. Anyone who wishes to report sexual misconduct, to learn more about the University process and options available, or to utilize a confidential resource, please visit ucmo.edu/titleix.

Diversity, Equity, and Inclusion

The University of Central Missouri strives to develop a campus environment that welcomes and recognizes all dimensions of diversity and inclusiveness. What this means is that all students are welcomed in the classroom, and differences are to be recognized rather than erased or denied. Dimension of diversity can include sex, race, age, national origin, ethnicity, gender identity and expression, intellectual and physical ability, sexuality, income, faith, and non-faith perspectives, socio-economic class, primary language, family status, military experience, and more. Inclusive learning is facilitated by creative and innovative thought and mutual respect; being in this classroom means that you, your faculty member, and your peers pledge to foster a welcoming and equitable environment for all.