



**CS 312-HBD1: Analysis of Algorithms**  
**Department of Physical and Computer Science**  
**COURSE SYLLABUS**

Instructor:	Professor Reid	Term:	Spring 2025
Office:	Online/AB1-503K	Class Schedule:	Mon 9:00 AM - 10:40 AM Wed 9:00 AM - 10:40 AM
Phone:	TBA	Class Location:	AB1-C09
Email:	jermainereid@mec.science	Lab Location:	Advance Computing Lab
Website:	TBA	Office Hours:	Mon 1:00 PM - 4:00 PM

**I. Welcome!**

Welcome to Analysis of Algorithms.

**II. University Course Catalog Description**

This course covers measuring algorithmic complexity (O-Notation); searching and sorting algorithms and their complexity; tree and graph algorithms and their complexity; classes of algorithms, such as divide-and-conquer, backtracking, greedy, probabilistic, etc. Computational complexity: the classes P and NP.

**III. General Education Requirement Fulfillments**

☐ Foundation Cluster

☐ General Knowledge Cluster

☐ Required Core

☐ Flexible Core

**College Option:**

☐ Socio-Cultural & Diversity Cluster

☐ Social Science Cluster

☐ Humanities & the Arts Cluster

☐ Natural Sciences & Mathematics Cluster

**IV. Course Overview**

This course covers measuring algorithmic complexity (Big-O Notation) of a variety of algorithms, such as searching, sorting, tree and graph algorithms, which include exploring different classes of algorithms, such as divide-and-conquer, backtracking, greedy, probabilistic, etc.

**V. Course Objectives / Student Learning Outcomes (SLOs)**

By the end of this course, students will be able to:

- Explain what is meant by “best”, “expected”, and “worst” case behavior of an algorithm;
- In the context of specific algorithms, identify the characteristics of data and/or other conditions or assumptions that lead to different behaviors;
- Determine the time complexity asymptotic boundary of algorithms;
- Use recurrence relations to determine the time-complexity of recursively defined algorithms;
- Choose an appropriate implementation of a data structure and apply appropriate algorithmic design methods from among brute force, greedy, divide and conquer, recursive backtracking, and dynamic programming to design and implement solutions to various problems;

- Solve problems using graph algorithms, including depth-first and breadth-first search, and single-source and all-pairs shortest paths.

## VI. Course Prerequisites

CS 246: Data Structures

## VII. Course Credits

3 credits; 4 class hours.

## VIII. Required Texts and Materials

Introduction to Algorithms, 3rd Edition, T Cormen, C Leiserson, R Rivest, C Stein 2009

ISBN-13: 978-0262033848

ISBN-10: 0-262-03384-4

## IX. Supplementary (Optional) Texts and Materials

To be announced on Brightspace, by email, and in class.

## X. Grading

The final grade will be determined based on a collection of assessments as follows:

Assessment	Percentage
Exams	60 %
Labs/Classwork	25 %
Projects	10 %
Homework	5 %
<b>Total</b>	100 %

The final grade will be a letter based on the following table:

Grading Scale (%)	
97 – 100	A+
93 – 96.9	A
90 – 92.9	A–
87 – 89.9	B+
83 – 86.9	B
80 – 82.9	B–
77 – 79.9	C+
73 – 76.9	C
70 – 72.9	C–
60 – 69.9	D
0 – 59.9	F

Additional criteria may affect your grade.

## XI. Grade Dissemination

Grades for all assessments will be published in Brightspace and sent by email.

## XII. Course Policies: Grades

**Late Work Policy:** There are no make-ups for missed assessments. Late submissions will be penalized.

**Extra Credit:** Extra credit will be provided. Details on extra credit will be provided in a supplementary document.

**Incompletes:** An Incomplete (INC) grade may be issued at the instructor's discretion when a student is performing at a passing level throughout the semester but, due to a valid reason, is unable to complete a major assessment. Issuing an INC requires an official contract signed by the student and the instructor. For additional information regarding INC grades, please refer to the College catalog.

**Revision Policy:** There are no revisions allowed unless otherwise specified.

### **XIII. Course Policies: Technology and Media**

Computers and other electronic devices can only be used to access lecture materials. Students are not to work on other materials in class.

Students must check email and Brightspace regularly for class information and announcements.

### **XIV. Student Expectations**

**Attendance Policy:** All students are responsible for attending classes regularly on time, and fully participating in course work. They are responsible for learning the material covered on the days they missed. The instructor is not obligated to reteach material under any circumstance. Assigned readings, problems, and programs should be completed before class.

**Disability Access** Medgar Evers College and its Office of Disability Services (ODS) are committed to ensuring that individuals with disabilities receive reasonable accommodations under the guidelines of the Americans with Disabilities Act. Any student who requires accommodations due to a documented disability should notify the ODS department.

**Academic Integrity** CUNY prohibits academic dishonesty and promotes penalizing such actions with academic sanctions. Academic Dishonesty as stated by CUNY is:

1. **Cheating** - the unauthorized use or attempted use of material, information, notes, study aids, devices, artificial intelligence (AI) systems, or communication during an academic exercise.
2. **Plagiarism** - the act of presenting ideas, research, or writing that is not your own as your own.
3. **Obtaining Unfair Advantage** - any action taken by a student that gives that student an unfair advantage in his/her academic work over another student, or an action taken by a student through which a student attempts to gain an unfair advantage in his or her academic work over another student.
4. **Falsification of Records and Official Documents**

A more detailed description can be found on the MEC website under the CUNY Policies section of the Office of Academic Affairs menu. The academic sanctions for academic dishonesty are provided in a supplementary document.

### **XV. Important Dates**

Check the official academic calendar from the Office of the Registrar for special dates such as the last day to add/drop classes, withdrawal deadline, closings, breaks, and examinations. Furthermore, at the discretion of the professor, exam dates can be changed.

### **XVI. Schedule**

The schedule, together with assignments, is subject to change in the progress of the course. Announcements made in the class and on the website/Brightspace/email override the schedule in case of conflicts.

Topic	Section
Mathematical Background	TBA
Asymptotic Analysis	TBA
Recurrence Equations & Master Method	TBA
Searching & Sorting Algorithms	TBA
Divide & Conquer Algorithms	TBA
Transform & Conquer	TBA
Heap Sort & Priority Queue	TBA
Space vs. Time Tradeoffs & Hashing	TBA
Breadth-First-Search (BFS)	TBA
Depth-First-Search (DFS)	TBA
Shortest Paths Algorithm	TBA
Dynamic Programming	TBA
Greedy Algorithms	TBA