Computer Science Department

Course Syllabus

Course Information

- CS 319 Algorithm Analysis – Spring 2025
- M/W 11:30am-12:55pm in HT236

Faculty Contact Information

- Dr. Jiang Li
- HT232; tentative office hours: W 9-11am/3-5pm Friday 12-1pm or by appointment or drop-in.

  Office hour zoom link:
  https://zoom.us/j/91099746311?pwd=Wol44fXKEOkP2JV3BhK22CAQb3YsSC.1
- lij@hood.edu (preferred); 301-696-3564

1. Course Description

This course surveys the most important algorithms and data structures in use on computers today. Particular emphasis is given to algorithms for sorting, searching, graphs, and strings. The course concentrates on developing implementations, understanding their performance characteristics, and estimating their potential effectiveness in applications.

Prerequisites: Calculus, Discrete Mathematics and Advanced Data Structures.

2. Course Objectives

By the end of the course, the student should have experience with and knowledge about the following topics.

- Demonstrate an understanding of "Big-Oh," Big-Theta," and "Big-Omega" notation.
- Analyze the computational complexity of algorithms (both time and space complexity).
- Evaluate the correctness of complex algorithms.
- Demonstrate an understanding of various algorithms as listed in the Class Schedule.
- Demonstrate a rudimentary understanding of the concept of "NP-Completeness."

3. Required Text And Tools

- Algorithms, 4th edition Robert Sedgewick and Kevin Wayne, ISBN-13: 978-0321573513

4. Course Outline

Following is a tentative course outline.

Week	Chapters
1	Syllabus, class overview, chapter 1 Fundamentals Programming Model/Data Abstraction/Stacks/Queues/Analysis of Algorithms
2	Chapter 1 continue
3	Chapter 2 Sorting Elementary Sorts/Mergesort/Quicksort/Priority Queues
4	Chapter 2 continue
5	Chapter 3 Searching Symbol Tables/Binary Search Trees/Balanced Search Trees/Hash Tables
6	Chapter 3 continue
7	***Mid Term***
8	Chapter 4 Graphs Undirected Graphs/Directed Graphs/Minimum Spanning Trees/Shortest Paths
9	Chapter 4 continue
10	Chapter 4 continue
11	Chapter 5 Strings String Sorts/Tries/Substring Search/Regular Expressions/Data Compression
12	Chapter 5 continue
13	Chapter 6 Context Event-Driven Simulation/B-Trees/Suffix Arrays/Maxflow/Reductions
14	Chapter 6 continue
15	Review
16	***Final Exam***

5. Class Evaluation

Grades will consist of the following components:

Component	Percentage
Class participation	10%
Homework/Projects/Quizzes	50%
Midterm	20%
Final	20%

Point distribution guideline will be as follows:

Point Range	Letter Grade
95.00-100	A
90.00-94.99	A-
85.00-89.99	B+
80.00-84.99	B
75.00-79.99	B-
70.00-74.99	C+
65.00-69.99	C
60.00-64.99	C-
55.00-59.99	D
0-54.99	F

Note: I reserve the right to alter component weighting or provide a "curve" on an assignment as warranted.

All assignments will be graded and returned in a timely manner. When an assignment is returned, you will have a period of one week to contest any portion of the grade. The instructor who graded your assignment will be the person to resolve a grading conflict. The judgment of the instructor will be final in all such cases. When contesting a grade, you must be able to demonstrate how your particular solution is correct. Also, when contesting a grade, the instructor reserves the right to re-evaluate the entire project or exam, not just the portion in dispute.

Important Note:

- This is a core course of the Computer Science Department. A grade of "C" or better is required for successful completion for any Computer Science student.
- If a student misses the midterm exam due to an emergency (as agreed in advance by the instructor and/or by providing a definite proof of medical or legal reason), there will be a makeup exam otherwise will result in a grade Zero in the midterm.
- The Final exam is mandatory. Missing the Final Exam without an official Excuse you would result to a grade of (F)

6. Homework Guidelines

Programming Assignments

- Platform: You may use any platform (i.e. Windows, OS X, Linux...etc) as long as

the version of Java is the same or later than the version used in class.

- Your assignments should compile and execute to either systems in the lab or, your computer or mine. If an assignment cannot be compiled and executed on any of these systems, it will receive zero points.
- Submission: Electronic, via the digital drop-box on Blackboard. Do not email your assignment (it will be discarded).

Non-Programming Assignments

Non-programming assignments would be posted on blackboard in the form of multiple choices, true/false, short answer questions. After completing the Assignment a feedback would be given to you with the correct answers and the grade of the Assignment

7. Programming Assignment Grading Scheme

Assignment Submission	***Earns***
Code does not compile or execute on designated system (Lab, PLUTO or WYRD)	0%
Code has been developed but does not compile.	5% or less
Code runs but with run-time failures, produces erroneous results.	20% or less
Code runs only with instrumented or fixed input.	30% or less
Code runs but partially addresses assignment requirements.	50% or less
Code runs and addresses all assignment requirements but is not optimal	75% or less
Code runs and addresses all assignment requirements and is optimal.	90% or less
Assignment complies fully with submission guidelines (e.g. adequate docs, File naming etc)	100%
Failure to comply with any one of the homework guidelines (e.g. poor docs etc)	minus 10%

8. Policies, Guidelines, Academic Honesty & Tips

- Adhering to the Academic Honesty Policy/Honor Code is student responsibility. Deviation from the policy will not be tolerated.
- Discussions with classmates are permitted but deliverables must be your own, individual work. This means you are free (and encouraged) to discuss assignments with other students outside of class; just don't share answers or code.
- Late assignment, up to 5 days, will be penalized by 20% each day; assignment more than 5 days late will receive a score of zero. No assignments will be accepted after the last day of class. Assignments turned in after they have been collected in class are considered late. No exceptions unless prior-arrangement.
- You are responsible for the content of reading assignments, lectures, handouts, announcements and schedule changes made in class whether you are present. If you must miss a class, be sure to check with me to cover the missed topics.
- Attendance is expected at each class and lab meeting. It affects the class participation grading and lab grading, it is in your own best interest to attend class and labs, as your grade will almost certainly suffer indirectly if you choose

not to attend.

- **Conditional Generate AI Usage** In this course, the use of Generative AI is permissible only under specific circumstances, as outlined in the assignment instructions. When AI tool usage is allowed, exercise caution and ensure that you appropriately cite and attribute any content generated through their use. It is essential to strike a balance between leveraging the advantages of AI resources and preserving your individual creativity and problem-solving abilities. Failure to adhere to the specified Generative AI usage guidelines may result in academic consequences. Pay careful attention to the assignment requirements to determine whether AI tools are permitted and follow the instructions accordingly.
- Finally, material in the course is, inherently, cumulative. Be aware, if you fall behind, it may be difficult to catch up. If you fall behind, ask for assistance as quickly as possible { I am here to help you).

Hood Policy Statements:

Hood Academic Honor Code

As a place of honor and respect, all members of Hood College assume the obligation to maintain the principles of honesty, responsibility, and intellectual integrity in all activities related to their Hood College experience. Students are expected to adhere to the highest standards of academic honesty and integrity in all coursework and related matters. It is the responsibility of each student to support these values through maturity of thought, expression, and action. Members of the faculty and staff are available to assist students in this process. The Academic Judicial Council, which is comprised of undergraduate students and two elected faculty members, is chaired by Dean Paige Eager. If you have questions about the Academic Judicial Council or the Hood College Honor Code, please contact Dean Eager at eager@hood.edu. All Honor Code matters related to graduate courses and graduate students should be referred to Dean April Boulton at boulton@hood.edu.

Counseling Services Information

If you are feeling stressed, worried, or down during the semester, or if you notice signs of emotional distress in someone else, please feel free to stop by Amanda Dymek's office or consider reaching out for support. Hood also has many campus resources that are available to support you including:

- Hood Counseling Services – open M-F, 8:30AM-5:00PM, Apple Resource building, 1st floor, Room A. Make your appointment online at hood.edu/counseling, or drop in for a walk-in session on Mondays, Wednesdays, and Fridays between the hours of 11:00AM – 12:00PM. If you have questions about Counseling Services, email counselingservices@hood.edu

- Hood also has several connections to other mental health resources including the NeighborHood Counseling Training Center and Thriving Campus.

If you or someone you know needs to talk to someone right now, text or call 9-8-8 for a free, confidential conversation with a trained counselor 24/7

Accessibility Services

This course is intended to be accessible for all students, including those with mental, physical, or cognitive disabilities, illnesses, injuries, impairments, or any other condition that tends to negatively affect one's equal access to education. If at any point in the term, you find yourself not able to fully access the space, content, and experience of this course, you are welcome (and not required) to contact me by email, phone, or during office hours to discuss your specific needs. I also encourage you to contact the Office of Accessibility Services (301-696-3569 or accessibilityservices@hood.edu). If you have a diagnosis or history of accommodations in high school or previous postsecondary institutions, Accessibility Services can help you document your needs and create an accommodation plan. By making a plan through Accessibility Services, you can ensure appropriate accommodations without disclosing your condition or diagnosis to course instructors.

Title IX

Hood College faculty are committed to helping create a safe and open learning environment for all students. If you (or someone you know) have experienced any form of sexual misconduct, including sexual assault, dating or domestic violence, or stalking, know that help and support are available. The College strongly encourages all members of the community to take action, seek support, and report incidents of sexual misconduct to the Title IX Coordinator. Please be aware that under Title IX of the Education Amendments of 1972, I am required to disclose information about such misconduct to the Title IX office. If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact the Dean of the Chapel (chapel@hood.edu), counseling services (counselingservices@hood.edu) , or health services (healthservices@hood.edu). For more information about reporting options and resources at Hood College and the community, please the contact the Title IX Coordinator.

Hood's commitment to inclusivity and campus values

Hood College is proud of its diverse community, and we are committed to cultivating and strengthening an inclusive, tolerant, multi-cultural, and intellectually open community with equal opportunity for all. By encouraging and celebrating our differences, we create an environment that promotes freedom of thought and academic excellence. It is our goal to have a respectful and nurturing academic community that affirms the inherent worth and dignity of every individual, and

celebrates the diverse backgrounds of all students, faculty, and staff. We will strive to value each person for their uniqueness and difference and to encourage all community members to reach their fullest potential.

Student Success Services

Your success in my class is a priority. For this reason, I will be using the Beacon as an early identification and intervention tool. If I notice that you are struggling with issues such as attendance, class participation, or assignment/test performance, I may choose to send an Academic Alert through Beacon in order to connect you with appropriate campus resources. These referrals are designed to maximize your chances for success at Hood College, not as a reprimand or punishment. Please respond to any communications you may receive from me, your academic advisor, the Student Success Center, your coach, the dean's office, or other campus offices regarding your academic progress in this course.

Important Contacts

- **Assessment questions, Nathan Reese, assessment@hood.edu**
- **Campus Bookstore: https://hood.ecampus.com/**
- **Campus Security, Chief Thurmond Maynard, maynard@hood.edu**
- **Chapel, Rev. Beth O'Malley, chapel@hood.edu**
- **Counseling Services, counselingservices@hood.edu**
- **Dean of Faculty and Academic Judicial Council Chair, Dr. Paige Eager, eager@hood.edu**
- **Dean of Graduate School, Dr. April Boulton, boulton@hood.edu**
- **Dean of Students, Dr. Demetrius Johnson, deanofstudents@hood.edu**
- **Dean of Student Success, Accessibility Services, Camelia Rubulcada, studentsuccess@hood.edu**
- **Health Services, Amanda Dymek, healthservices@hood.edu**
- **IT Help Desk, helpdesk@hood.edu**
- **Instructional Technology (Blackboard), Jeff Welsh, welsh@hood.edu**
- **Provost, Dr. Debbie Ricker, provost@hood.edu**
- **Counseling Services: counselingservices@hood.edu**
- **Health Services: healthservices@hood.edu**