

CS1332 Syllabus

Course Information

Course Prefix and Number: CS1332

Course Name: Data Structures & Algorithms

Instructor: Borela Valente, Rodrigo

Course Description

Data Structures & Algorithms introduces students to the essential data structures and algorithms that underpin modern software development. Students learn how to implement, analyze, and optimize a broad range of linear, nonlinear, hierarchical, and probabilistic structures and their associated algorithms, with an emphasis on performance analysis, algorithm design, and secure computing practices.

Course Learning Outcomes

Students will visualize, understand, and implement essential data structures and algorithms used throughout software development. The following topics are part of the learning objectives of the course:

Data Structures

- Arrays & ArrayLists
- LinkedLists (Singly, Doubly, Circular)
- Stacks, Queues, Deques, SkipLists
- Trees: Binary Search, AVL, Heaps, 2-4
- Maps and HashMaps
- Graphs

Algorithms

- Sorting: Bubble, Insertion, Selection, Merge, Quick, Radix
- Pattern Matching: Brute Force, Boyer-Moore, KMP, Rabin-Karp
- Graph Algorithms: BFS, DFS, Dijkstra's, Prim's, Kruskal's
- Dynamic Programming

Core Skills

- Advanced Java programming
- Big-O notation & performance analysis
- Algorithm design & optimization
- Testing & debugging techniques
- Secure computing practices

Required Course Materials

The course does not have a required textbook, and handouts, class notes, and other materials will be provided to the students throughout the course by the instructional team.

Grading Policy

This course uses a fixed grading scale. Grades are not curved. Final grades are calculated to the nearest tenth. Scores are not rounded up. For example, a final score of 89.9 will be recorded as a B, not an A. Scores are calculated using the following assignment category percentages:

Homework Assignments (4)	5%
Projects and Demos (3)	24%
Project Pre-Quiz	1%
Midterm 1	20%
Midterm 2	20%
Final	30%

Letter Grade Scale:

A	90.0 and above
B	80.0 – 89.9
C	70.0 – 79.9
D	60.0 – 69.9
F	Below 60.0

Pass/Fail Option: Students taking the course on a Pass/Fail basis must earn a minimum score of **70.0** to receive a Pass.

Description of Graded Components

All homework, quizzes, projects, and exams are individual assignments; collaboration must abide by the course academic integrity policy. Exams are timed and closed-book with no supporting materials permitted. Homeworks are shorter assignments in which students directly implement data structures or algorithms as taught in lecture. Projects are larger-scale, multi-week assignments that challenge students to apply course concepts in a broader context, this may involve implementing more complex ideas, modifying existing code, or synthesizing multiple data structures and algorithms into a single solution.

Attendance Policy

Attendance is required for lectures and strongly encouraged for recitations. You are fully responsible for all course content and administrative announcements made during class, including updates to the syllabus, assignments, and exam schedules. Missing class may negatively impact your understanding of the material and your ability to participate meaningfully. Absences must be documented and approved through the Dean of Students.

Academic and Research Honesty/Integrity Statement

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Every student is expected to read, understand and abide by the Georgia Tech Academic Honor Code: <http://osi.gatech.edu/content/honor-code>.

Midterm and final exams are considered property of the professor. Any student who is found to have taken an exam without permission from the professor, prior to the exam being administered, will receive a zero. All cases will be sent directly to OSI.

When working on assignments, you may *not* directly copy code from any source (other than your own past submissions). You are welcome to collaborate with peers and consult external resources, but you must personally write all of the code you submit. You must list, at the top of each file in your submission, every student with whom you collaborated and every resource you consulted while completing the assignment.

You may NOT directly share any files containing assignment code with other students or post your code publicly online. This means that you should never have another student's code in front of you or on your computer, and your code should never be on anyone's computer. Additionally, directly debugging another student's code will be considered inappropriate collaboration. If you wish to store your code online in a personal private repository, you can use GitHub Enterprise (<https://github.gatech.edu/>) to do this for free.

The only code you may share is JUnit test code on a pinned post on the official course Piazza. Use JUnits from other students at your own risk; we do not endorse them. See each assignment's PDF for more details. If you share JUnits, they must be shared on the site specified in the Piazza post, and not anywhere else (including a personal GitHub account). You are prohibited from posting course materials including quizzes, exams, and projects on the Internet (including public Github). If any student copies your work, you will be considered as having committed plagiarism as well.

Artificial Intelligence Policy

The use of AI-generated code is PROHIBITED on all assignments. Any assignment submission found to have copied code from a chatbot will be considered a violation of Honor Code, just like copying from any other source, and will be submitted to the Office of Student Integrity. This includes GitHub Copilot and the Full-Line Code Completion Feature in IntelliJ Ultimate Edition. If your editor is generating lines of code for you, that is a violation of the Honor Code and you must disable that feature. If you are unsure what the line is between collaborating with AI and copying AI, we recommend the following heuristics:

Heuristic 0: You should almost never be directly reading code that you did not write, whether generated by an LLM or any other source.

Heuristic 1: Never hit "Copy" within your conversation with an AI assistant. Do not copy anything from the conversation into your assignment, nor should you copy your work or assignment instructions into the conversation. Instead, use your interaction with the AI assistant as a learning experience, then let your assignment reflect your improved understanding.

Heuristic 2: Do not have your assignment and the AI agent open at the same time. Similar to the above, use your conversation with the AI as a learning experience, then close the interaction down, open your assignment, and let your assignment reflect your revised knowledge. This heuristic includes avoiding using AI directly integrated into your composition environment: just as you should not let a classmate write content or code directly into your submission, so also you should avoid using tools that directly add content to your submission.

Deviating from these heuristics does not automatically qualify as academic misconduct; however, following these heuristics essentially guarantees your collaboration will not cross the line into misconduct.

Core IMPACTS

Does not apply.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs [contact the Office of Disability Services](#)

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. I encourage you to remain committed to the ideals of Georgia Tech while in this class. [Expectations of Advisors and Advisees.](#)

- It is expected that everyone will follow the Student-Faculty Expectations document, and the Student Code of Conduct. The teaching team expects a positive, respectful, and engaged academic environment inside the classroom, outside the classroom, in all electronic communications, on all file submissions, and on any document submitted throughout the duration of the course.

- No inappropriate language is to be used, and any assignment deemed by the professor to contain inappropriate or offensive language will receive a zero.
- Piazza is a discussion platform for content only. Piazza is NOT social media. Any post that negatively targets an individual or disputes course policies or logistics will be removed. Students are to directly contact their professor to discuss these matters. If an individual repeatedly violates this policy, then the individual will address any future questions directly with the professor.
- Additionally, you are to conduct yourself professionally when attending office hours, recitation, exams, and Demos. Any inappropriate language, behavior or tone with the TAs will result in you being asked to leave and/or receiving a zero on the assessment.
- You are to use professionalism in your work. Serious violations of this conduct policy will be turned over to the Office of Student Integrity for misconduct.