CIS351 - Data Structures

Spring 2026

L.C. Smith College of Engineering and Computer Science
Syracuse University

IMPORTANT NOTE![1]

Your learning and success in this course are really important to me!

Many students encounter obstacles during the course of the semester, be those obstacles with course content or life circumstances. Whenever you believe you could benefit from extra support or assistance, please reach out to me as soon as possible! We can work together to get you back on track and ensure you are able to complete your assignments successfully.

I understand life happens, and I will be more than happy to accommodate you! Please do not wait to ask for assistance, and talk to me as soon as possible if you are concerned about your grade or being able to meet a deadline.

Meeting Times and Locations

Lectures

Tuesdays and Thursdays, 12:30–1:50PM — Hall of Languages, Room 202

Labs

- Section M002: Wednesdays, 9:30–10:25 AM — Link Hall, Room 011
- Section M003: Wednesdays, 10:35–11:30 AM — Link Hall, Room 011

Q&A and Assistance Hours[2]

Extra sessions may be available throughout the semester, in which case I will inform you ahead of time.

Prof. Gabriel Oliveira - Instructor:

Location: CST 3-125
Time: Tuesdays and Thursdays, 2:30PM – 4:30PM
(other times available by appointment)

Yunhui Zhu - Teaching Assistant:

Location: CST 3-108
Time: Fridays, from 2PM to 4PM.

Virtual Assistance:[3]

Find our class Piazza page at:
https://piazza.com/syr/spring2026/cis351 (Access code: CIS351Spring26)

[1] Note added at the very beginning of the syllabus to encourage students to seek assistance, even if their reasons for struggling do not stem from the course.
[2] The term "office hours" was changed to "Q&A and Assistance Hours". The change in language offers a more approachable idea of those hours for students to receive support.
[3] All virtual assistance is now centered in one place; students know where to ask questions and don't receiving multiple, possibly conflicting, responses.

Course Materials

Textbooks[4]

All textbooks in this course are *recommended*, not required. All required materials will be provided by the course staff.

1. **Dan S. Myers**, *Data Structures and Algorithms in Java: A Project-Based Approach*. Cambridge University Press, 2024.
2. **Pat Morin**, *Open Data Structures (Java edition)* — available (for free) at: `http://opendatastructures.org/`

Course Page

In this course we use **Blackboard** (`https://blackboard.syr.edu/`), which you will access with your SU NetID and password. If you're taking this class remotely, be aware that Blackboard uses Eastern Time.

Any and all announcements will be made through Blackboard, which should be shown in your course page and also sent to your email. Check announcements and your inbox routinely.

All materials other than the textbook will be posted on Blackboard, including *(but not limited to)*: this syllabus, lecture notes, recommended readings, links, assignments, and grades.

Course Objectives[5]

1. Implement core data structures (arrays, linked lists, stacks, queues, binary trees, heaps, hash tables, graphs) in a programming language and verify correctness through tests and debugging.
2. Calculate the time complexity of data-structure operations using Big-O notation and justify which structure is most efficient.
3. Select and apply an appropriate data structure to a programming problem and explain in writing why it satisfies functional and performance requirements.
4. Implement and compare searching, including BFS and DFS, and sorting algorithms by calculating runtime complexity.
5. Construct recursive algorithms for tree and graph problems and trace their execution.
6. Produce a complete software solution that utilizes data structures appropriately chosen upon inspection of problem constrains.

[4] Textbooks are now recommended instead of required. All necessary materials are given to students, avoiding the need for them to spend extra money on the course.

[5] Previous course objectives were removed and replaced with the new 6 outcomes above. The new objectives were designed to be clear and measurable, so students can understand what they are expected to achieve and how that can be measured. Each learning objective now focus on a unique concept, even if that particular concept can be applyed to multiple course topics; i.e. "Implement core data structures" followed by "Calculate time complexity", instead of having multiple outcomes that state the same concept for each different structure.

Assignments and Weights

Projects[6]

We will have 3 projects. Each project will be equivalent to 20% of your grade, totaling 60% of your final grade.

Each project will last 3 weeks and will be divided into milestones for each week.

In general, each project should cover the following areas:[7]

- Project 1: Implementing Fundamental Linear Data Structures. Mapped to learning outcomes LO1, LO2, LO6.
- Project 2: Sorting, Searching, and Trees. Mapped to learning outcomes LO1, LO2, LO4, LO6.
- Project 3: Graph Processing and Multi-Structure Application. Mapped to learning outcomes LO1, LO3, LO5, LO6.

Each project will be divided into implementation, testing, and report. Each one of these categories will be further broken down into subcategories relevant for each project.

Labs[8]

We will have one lab per week. Generally we have 13 labs in a semester, but the number of labs may be adjusted depending on semester schedule.

Labs will involve a programming assignment directly related to concepts learned in the previous two lectures, along with theory questions.

Each lab will have its own rubric. All labs together will total the remaining 40% of your grade, but the weight for each lab will depend on its difficulty.

Grading Scale

Let G be the your score.

A:	$G \geq 93$
A-:	$90 \leq G < 93$
B+:	$85 \leq G < 90$
B:	$80 \leq G < 85$
B-:	$75 \leq G < 80$
C+:	$70 \leq G < 75$
C:	$65 \leq G < 70$
C-:	$60 \leq G < 65$
D:	$55 \leq G < 60$
F:	$0 \leq G < 55$

[6] Exams were replaced with projects, which give students a better opportunity to practice concepts and be assessed without relying on memorization.
[7] Projects are well defined within the course concepts and directly mapped to learning outcomes.
[8] Labs have been expanded to include questions on the theory that was previously tested on exams, again without relying on memorization.

Course Policies

Late Submission

All assignments may be submitted up to 48 hours late: **1 point per hour**. Not accepted after 48 hours. Reading and in-class activities not accepted late without valid justification.

Retakes and Grade Improvement

Extra assignment/homework may be given for students upon request when they wish to improve their grade *in a specific assignment and/or learning outcome*. Approval will be assessed on a case-by-case basis, and must be discussed with the instructor. **No requests will be approved after Monday, April 13th.** *No Incomplete grade will be given without a valid reason. Academic integrity violations override the grading scale. Instructor reserves the right to adjust the scale as necessary.*

AI Use[9]

The use of AI is permitted in this course. However, when you do use AI tools you are required to cite when, where, and how those tools were used. Failing to cite AI use will incur an academic integrity violation.

Use of Class Time

Class meetings are for teaching, learning, and technical discussion. Policy/suggestion concerns are handled in office hours.
Please be respectful during lectures and refrain from excessive talking and/or electronics use. Come to lecture prepared to pay attention and participate.

Attendance and Participation

Attendance is expected, but not required. When you do attend class, please be ready to pay attention. In-class activities may be graded and cannot be made up. You are responsible for announcements and material. Follow university rules and communicate early when issues arise.

Discussion Board Policy

Use the Piazza forum for questions (best-effort responses within 48 hours on weekdays). Avoid last-minute posts.

[9] AI is now permitted, acknowledging students will have access to it once they reach the workforce. It is better for them to use AI in a place where they can make mistakes.

University Policies and Resources[10]

Health & Wellness

Well-being and mental health are significant predictors of academic success. It is critical to take care of yourself physically and emotionally and to effectively navigate stress, anxiety, and depression. Please familiarize yourself with the range of resources the Barnes Center provides (https://ese.syr.edu/bewell/) and seek out support for mental health concerns as needed. Counseling services are available 24/7, 365 days, at 315-443-8000.

Additionally, if you feel comfortable, you can reach out to the instructor. The course staff will be happy to help you navigate difficult times.

Academic Integrity & AI Use

As a pre-eminent and inclusive student-focused research institution, Syracuse University considers academic integrity at the forefront of learning, serving as a core value and guiding pillar of education. Syracuse University's Academic Integrity Policy provides students with the necessary guidelines to complete academic work with integrity throughout their studies. Students are required to uphold both course-specific and university-wide academic integrity expectations such as crediting your sources, doing your own work, communicating honestly, and supporting academic integrity. The full Syracuse University Academic Integrity Policy can be found by visiting `go.syr.edu/academic-integrity`, selecting, "Academic Integrity," and "Expectations and Policy."

Upholding Academic Integrity includes the protection of faculty's intellectual property. Students should not upload, distribute, or share instructors' course materials, including presentations, assignments, exams, or other evaluative materials without permission. Using websites that charge fees or require uploading of course material (e.g., Chegg, Course Hero) to obtain exam solutions or assignments completed by others, which are then presented as your own violates academic integrity expectations in this course and may be classified as a Level 3 violation. All academic integrity expectations that apply to in-person assignments, quizzes, and exams also apply online.

Students found in violation of the policy are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered. Students may not drop or withdraw from courses in which they face a suspected violation. Any established violation in this course may result in course failure regardless of violation level.

Based on the assignments in this course and our specified learning outcomes, the full use of artificial intelligence as a tool, with disclosure and citation, is permitted in this course. Students do not need

[10] Text for all university policies was changed to be more friendly, and to follow university guidelines.

to ask permission to use these tools before starting an assignment or exam, but they must explicitly and fully indicate which tools were used and describe how they were used. Any and all use of AI tools must be cited in your submissions. All students code files may be checked using MOSS.

When you are unsure whether something is an Academic Integrity violation, please communicate with the course staff.

Accommodations

Course staff will ensure accommodations are respected. To receive accommodations, please coordinate with Office of Disability Services (304 University Ave, Room 309, 315-443-4498). If you are unsure of how to receive accommodations, please reach out to the instructor.

Syracuse University values access and inclusion; we are committed to a climate of mutual respect and full participation. There may be aspects of the instruction or design of this course that result in barriers to your inclusion and full participation in this course. I invite any student to contact me to discuss strategies and/or accommodations (academic adjustments) that may be necessary to ensure equitable access, and to collaborate with the Center for Disability Resources (CDR) in this process.

If you would like to discuss disability-related accommodations or register with CDR, please visit Center for Disability Resources. Please call 315.443.4498 or email CDRspecialist@syr.edu for more detailed information.

CDR is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations are generally not provided retroactively, please contact CDR as soon as possible to initiate this process.

Religious Observances

Use MySlice to notify instructors by the academic drop deadline. Deadline exceptions will be made to respect any and all Religious Observances.

Syracuse University's Religious Observances Policy recognizes the diversity of faiths represented in the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their traditions. Under the policy, students are given an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance, provided they notify their instructors no later than the academic drop deadline. For observances occurring before the drop deadline, notification is required at least two academic days in advance. Students may enter their observances in MySlice under Student Services/Enrollment/My Religious Observances/Add a Notification.

Discrimination or Harassment

All forms of discrimination and harrassment are strictly prohibited in the context of this course.

If you witness some the occurrance of discrimination or harrasement, please report directly to course staff or to Equal Opportunity & Title IX Office (005 Steele Hall; titleix@syr.edu; 315-443-0211).

The University does not discriminate and prohibits harassment or discrimination related to any protected category including creed, ethnicity, citizenship, sexual orientation, national origin, sex, gender, pregnancy, reproductive health decisions, disability, marital status, political or social affiliation, age, race, color, veteran status, military status, religion, sexual orientation, domestic violence status, genetic information, gender identity, gender expression or perceived gender.

Any complaint of discrimination or harassment related to any of these protected bases should be reported to Sheila Johnson-Willis, the University's Chief Equal Opportunity & Title IX Officer for Faculty and Staff. She is responsible for coordinating compliance efforts under the various laws including Titles VI, VII, IX and Section 504 of the Rehabilitation Act. She can be contacted at Equal Opportunity, Inclusion, and Resolution Services, 621 Skytop Road, Suite 1001, Syracuse University, Syracuse, NY 13244-1120; or by email: equalopp@syr.edu; or by telephone: 315-443-4018.