# CSCI-UA 102, Section 7: Data Structures

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Office Hours: 1-2pm, NYU Center for Data Science, 60 Fifth Ave, Room 402

## Course Information

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| **Course Title:** | Data Structures |
| **Section:** | CSCI-UA 102, Section 7 |
| **Class Lectures:** | Monday and Wednesday, 11:00 am - 12:15 pm,<br>251 Mercer Street, Warren Weaver Hall, Room 312 |
| **Recitation:** | Friday, 11:00 am - 12:15 pm,<br>Bobst Library, LL138 |
| **Recitation Instructor:** | Aman Gupta (NetID: ag9900) |
| **Grader:** | Vaishnavi Venkateswaran (NetID: vv2342) |

## Course Description

Use and design of data structures, which organize information in computer memory. Stacks, queues, linked lists, binary trees: how to implement them in a high-level language, how to analyze their effect on algorithm efficiency, and how to modify them. Programming assignments.

### Prerequisites

Introduction to Computer Science (CSCI-UA 101), or a score of 4 or 5 on the AP Computer Science examination.

### Topics Covered

Basic Programming Techniques, Asymptotic Analysis, Arrays, Linked Lists, Stacks, Queues, Trees, Heaps, Sorting and Searching, Hash Tables, Graphs, Huffman Codes.

### Textbook

*Data Structures and Algorithms in Java, 6th edition*, Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser. Code can be found on GitHub: `https://github.com/rysharprules/Data-Structures-and-Algorithms-in-Java-6th-Edition`

## Course Goals

Students who take this course will:

- Understand the core data structures, be able to implement them, and make informed decisions about which ones to use in various situations.
- Have the tools to design new data structures and analyze unfamiliar ones they encounter.
- Be proficient in basic asymptotic analysis, using it to evaluate the efficiency of algorithms and communicate key information about data structures and algorithms.
- Enhance their programming skills in Java, gaining experience in designing interfaces, creating classes, developing algorithms, handling input/output, debugging, and problem-solving.
- Develop a deeper appreciation for the practice of writing code, understanding the principles behind it, and be inspired by the complexity and elegance of the applications they build through their homework assignments.
- Understand the historical and academic context of key discoveries in computer science, and how these contributions have shaped the practices and techniques covered in the course.

## Lectures and Recitations

Lectures are interactive; students are expected to be in class and participate in class discussions. Recitation is mandatory. In addition to reviewing topics from class, we will be going over homework assignments, doing quizzes, and introducing further explanation and exploration. Tentative Schedule (updated throughout the semester):
`https://docs.google.com/spreadsheets/d/1lfd1brq7lR6F32x5Qigio6reDA8wiFT9k42lcJbYZJo`

## Course Policies

This course follows CAS Academic Policies that can be found at `https://cas.nyu.edu/academic-programs/bulletin/policies/`

**You are expected to do your own work.** A readme file will be required with every programming assignment with information about time spent and resources used to complete the assignment. Valid resources include:

- Consulting the instructor, the recitation leader, or the class tutor.
- Working collaboratively with other students while still submitting your own work (sharing approaches and ideas is valid, as well as helping each other debug).

- Using online resources and AI coding assistants, so long as it's done after attempting the assignment yourself, and to find tricky errors rather than writing the code wholesale. See AI coding policies below.

All resources used should be documented in the readme file. There is no penalty for reporting resources, but there are penalties for a missing or incomplete readme file.

### AI Coding Policies

Begin each programming assignment on your own. Attempt to complete the project independently before using AI tools.

**Acceptable Use Cases:**

- Debugging and finding syntax errors.
- Looking up syntax and language-specific details.
- Gaining verbal explanations or clarifications of programming concepts.

**Unacceptable Use Cases:**

- Generating complete solutions or significant portions of the code.
- Directly copying code generated by AI without understanding it.

**Documentation Requirement:** If AI tools are used, document what was used and why in the assignment's readme file. More instructions will be given with the homework assignments. Refer to the Computer Science Academic Integrity Policy: `https://cs.nyu.edu/home/undergrad/policy.html`

## Grade Breakdown

- 40% for the final exam (December 18, 2024)
- 20% for the midterm exam (October 15, 2024)
- 20% for the programming assignment
- 20% for quizzes and non-programming assignments
- To pass the course, students must complete at least three programming assignments demonstrating basic functionality. To attain a grade of B- or higher, students must complete at least four programming assignments demonstrating basic functionality.
- Extra Credit: Some extra credit may be available on one of the programming or non-programming assignments. Class participation can also be used to award extra credit.

## Attendance and Tardiness

Students are expected to attend all classes and recitations. A few missed sessions are expected due to illness and other obligations. When this happens, you should speak to the instructor and ensure that you are caught up.

## Late Assignment Policy

There are 7 free days total that can be used to extend project deadlines. After that, there is a 25% penalty for a late assignment, which will be accepted up to 2 weeks after the deadline.

## Disability Disclosure Statement

Students requesting academic accommodations are advised to reach out to the Moses Center for Student Accessibility (CSA) as early as possible in the semester for assistance.
Henry and Lucy Moses Center for Student Accessibility
Telephone: 212-998-4980
Website: `https://www.nyu.edu/csa`
Email: mosescsa@nyu.edu