



CS_OX 253: Data Structures and Algorithms

with Dr. [Ting Li](#) (Email me: tli41@emory.edu)



Overview: in this course we study fundamental data structures and algorithms. We study how to use and practice algorithms implementation in the Java programming language, how to verify the correctness and analyze the performance of algorithms, and how to describe algorithms to others. This course uses the programming skills that you developed in CS170 and CS171, and it introduces new skills of analysis and presentation that you will need in CS326 and beyond.

Prerequisites: this course continues CS171 (or equivalent). You should have already seen Java with interfaces and inheritance. You should have had a first look at some basic data structures: the array, the stack, the queue, the linked list, the binary search tree, and the hash table. You should have seen efficient sorting algorithms, including merge sort and quick sort. You should have seen the notion of a graph, including adjacency lists and some basic graph traversal.

Course Learning Objectives: At the conclusion of this course, students should be able to

- have a comprehensive and deep understanding on various algorithms and data structures.
- use and practice algorithms implementation in the Java programming language
- verify the correctness and analyze the performance of algorithms
- properly select the most effective structures and efficient algorithms for given problems
- clearly describe algorithms to others

Materials: our main textbook is [Algorithms \(4th edition\)](#), by Sedgwick and Wayne. You should have a copy ([printed](#), [ebook](#)), or PDF is fine). Besides the text, we will be using materials (code, slides, and videos) from the [textbook website](#), from wikipedia, and beyond. You should have reliable access to a laptop and an internet connection, sufficient for writing Java programs or attending online classes in case. If not, please let me know!

Scheduled Class: MW 8:30am-9:45am at Pierce Hall 140

Staff: Dr. Ting Li will work with you for this semester. You may reach me via Canvas, by email at tli41@emory.edu or by appointment) you could also see me in person at Pierce Hall 127 MW 11:45am-1pm.

Class time: Class time will be used for lectures, discussions and group work. The group work means you and your group mates will work in groups on course exit quizzes after each lecture. Attending class is essential to be succeed in this course.

Canvas: We will use Canvas for announcements, lecture materials, discussions, assignments, and grading. You should see a **daily schedule of lecture topics** on Canvas listed by months. Beyond Canvas, we may also use some other web services for sharing code, and for coding challenges. We also use [OneDrive](#) to share some materials (codes, dataset, etc.), and Here is the link: https://emory-my.sharepoint.com/:f:/g/personal/tli41_emory_edu/EnxROmbKGopGtZO3X9vnh8AB1_AFXr6OqaBKDcWdFJEpDA?e=xNxlag

Graded Work: we will have a series of programming assignments (4 coding assignments, 20%) and written assignments (11 written assignments, 35%). Together, they will count for 55% of your course grade. At the end of this course, the lowest grades of written assignments will be dropped automatically. To make sure you understand each lecture well, we will have lecture exit quizzes, which you need to finish them at the end of each lecture or after class, count for 10% of your grade. We will have two midterms, together they count for 14% of your grade. At the end of course, we will have final exam, which count for 10%. Note the grade of these exams will be curved so that the median mark is at least 85% (a B). There are 5% for "discussion", which is fulfilled by posting your reflections while reading the text book. The remaining 6% is for "Final presentation", where you present an algorithm at the end of this course and these algorithms should be something uncovered in this course. Here is a summary table of percentage for each course work:

Course Work	Percentage	Notes
Writing Assignment	35%	<ul style="list-style-type: none"> These are individual work, please work on it by yourself and using of AI tools is also a violation of Honor Code. The lowest score in Writing assignment will be dropped. Late submission policy applied (20% deduction for every extra day, up to a maximum 3 days). You have a "bank" of 3 days of lateness.
Coding Assignment	20%	
Participation	5%	
Lecture Exit Quizzes	10%	<ul style="list-style-type: none"> These are group work. Please finish these quizzes with any classmate together. You have only two chances for each quiz and the highest score will be recorded.
Final Presentation	6%	<ul style="list-style-type: none"> You will give a presentation with a classmate.
Midterm 1	7%	<ul style="list-style-type: none"> The grade will be curved with the median mark at least 85%
Midterm 2	7%	
Final	10%	

Total 100% • Start as early as possible and work hard.

It is your responsibility to know what is covered in class meetings, to review the course materials, and to attempt all assigned work. If you find an assignment difficult, you should let me know; I am willing to offer extensive help if necessary. Late work on assignments has a penalty of 20% per day, up to a maximum of 3 days (after that, you will receive 0 and I will want to talk to you). However, you'll have a "bank" of 3 days of lateness, that you may apply to assignments as you wish. Time extensions may also be granted, for good reasons, if you ask in advance. Please start as early as possible. However, if you cannot finish things, please let me know; I will work with you to catch up, and to pass the course.

At the end of the semester your grade on Canvas will be covered to a letter grade according to this table:

Letter grade	Minimum grade on Canvas
A	92.7
A-	90
B+	86.7
B	82.7
B-	80
C+	76.7
C	72.7
C-	70
D+	66.7
D	60
F	0

Policies: Your work for this class is governed by the [Oxford Honor Code](#). Unless instructed otherwise, you should not give, access, or receive any information not expressly permitted by the instructor on assignments or exams. On the other hand, the following kind of collaboration is allowed: interpreting the statement of a problem, understanding a Java error message, learning features of software tools, or reviewing the course materials. If you are in doubt about what is allowed, feel free to ask me.

Here is the general **AI policy at Emory: using an artificial intelligence program** to generate any content for any assignment in this course (including, but not limited to examinations, papers, homework, and creative work) **constitutes plagiarism and is a violation of the Honor Code**. The use of an artificial intelligence program in this course without permission from the instructor may also constitute seeking unauthorized assistance or violate other provisions of the Honor Code. Any suspicion of academic misconduct will be reported to the Honor Council.

In our class, generally, **you are not allowed to using AI program for your work** unless it's permitted for specific questions, which will be clearly stated.

Programming work is also covered by the [Computer Science SPCA](#). In particular, this means that you should take care to protect the confidentiality of your homework files, and that your Java code submissions should start with these two lines:

```
// THIS CODE IS MY OWN WORK, IT WAS WRITTEN WITHOUT CONSULTING  
// A TUTOR OR CODE WRITTEN BY OTHER STUDENTS - YOUR NAME
```

Apparent honor code violations will be referred to the Oxford Honor Council.

Special Accommodations: Access, Disability Services and Resources (ADSR) works with students who have disabilities to provide reasonable accommodations. In order to receive consideration for reasonable accommodations, students must contact ADSR and complete the

registration process. Faculty may not provide disability accommodations until an accommodation letter has been processed; accommodations are not retroactive. Students registered with ADSR who receive a letter outlining specific academic accommodations are strongly encouraged to coordinate a meeting time with their professor to discuss a protocol to implement the accommodations as needed throughout the semester. This meeting should occur as early in the semester as possible. Contact Access, Disability Services and Resources for more information at (770) 784-4690 or adsroxford@emory.edu. Additional information is available at the ADSR website at <http://equityandinclusion.emory.edu/access/students/index.html>.

Religious Holidays: Instructors are encouraged, not required, to accommodate students' academic needs related to religious holidays. Please make every effort to negotiate your religious holiday needs within the first two weeks of the semester; waiting longer may compromise your instructor's ability to extend satisfactory arrangements. If you need guidance negotiating your needs related to a religious holiday, the College Chaplain, Rev. Lyn Pace, ppace@emory.edu, Candler Hall 202, is willing and available to help. Emory's official list of religious holidays may be found at: <https://religiouslife.emory.edu/includes/documents/religious-holidays-list-2024-25.pdf>.

This syllabus is a guide for effective learning in this class; it is not a legal contract. The instructor reserves the right to modify the syllabus as needed