CS 171: Introduction to Computer Science II
Instructor: Ting Li

Staff: Dr. Ting Li will work with you for this semester. You may reach me by email at tli41@emory.edu . You are also welcomed to visit me in-person (Pierce Hall 127) during our office hours (tentative schedule: MW 11:45am-1pm) or by appointment. If it's about coding, please send your question to tli41@emory.edu at least 2 hours before the meeting.

Class: MW 10am – 11:15am at Pierce Hall 140

Textbook: There are **no** required textbook for this class. There are some great books and resources that student might want to add to their library. For example, **Data Structures and Algorithms in Java** (6th Edition), by Goodrich, Tamassia, and Goldwasser. Princeton's **Algorithms** (4th edition) by Robert Sedgewick and Kevin Wayne. You could also read large chunks of Sedgewick's book (but not everything) at https://algs4.cs.princeton.edu/home/. We also have our own website (http://math.oxford.emory.edu/site/cs171/) for the past and you are welcome to check it out by yourself.

Other required materials: You will need access to a computer for coding (in-class activities and assignment) and other activities (taking quizzes etc.). Last but not least, having a flash drive to regularly backup your work is also highly recommended.

However, course unrelated computer activities are forbidden during our lecture time. If you don't use your computer properly, I would ask you simply turn it off for better learning outcome.

Overview: This course is a continuation of CS170. Emphasis is on the use and implementation of data structures, and fundamental algorithms, with introductory algorithm analysis, and object-oriented design and programming with Java. Students will be given many opportunities to write programs to demonstrate their mastery of the algorithms and data structures covered in this course. Problem solving and real-world applications will play an important role, providing a driving motivation for developing and/or selecting appropriate algorithms or data structures to accomplish the associated goals as efficiently as possible.

Prerequisites: Successful completion of CS 170 or an equivalent course.

Course objectives: Students at the conclusion of this course should be able to...

- Understand and use the following features of Java: class, inheritance, polymorphism, abstract class and interface.
- Implement and use various abstract data types, including (but not limited to) stacks, queues, lists, heaps, hash tables, trees and graphs to accomplish various tasks
- Analyze and measure the algorithms regarding their running time in best, average and worst-case scenarios
- Implement a variety of sorting algorithms, including selection sort, insertion sort, merge sort, quicksort, and heap sort, understanding the advantages and disadvantages of each sorting algorithm
- Implement a variety of searching algorithm, including binary search trees, balanced search algorithm, 2-3 tree, and red-black tree
- Implement and use graphs with its related algorithms, including graph traversal algorithm, MST and shortest paths.

Expected workload: Students are expected to complete those three components for each week: attending classes for lectures and in-class quizzes, and finishing the weekly homework. They are vital for succussing in this course.

Meetings in class: Class time will be used for lectures, examples, codes and in-class quizzes. Attending class in-person is fundamental to be succeed in this course. Hence, students are expected to show up each class. Your attendance will be regularly recorded and you could be absent for **at most 3** classes without notifying Dr. Li. There are 19 in-class quizzes in total and you will finish them with your classmates. You have 2 attempts for each quiz and the highest score will be recorded.

Weekly homework: There will be ~8 assignments (individual work) for improving your programming skills and code analysis. You will have one week to finish them after published. Some ungraded assignment would be also published for practice purpose and for those assignment, nothing needs to be submitted.

Exams: You will have **two midterms** and **a final exam** for this class. The tests will emphasize reading, understanding, and solving the program about all of the algorithms. Doing well on final exam will strongly correlate to having read and understood the materials provided, and having worked in earnest -- and successfully -- on the programs assigned up to that point in the class.

Late Submission Policy: Student will get 70% of the grade if student finish assignment overdue **less than TWO days**. Missed or late submission (>2 days) will receive a grade of zero. Note there is **no make-up exams.** However, you have a valid reason for a makeup exam or extension, inform me as soon as possible. Valid reasons include medical emergency, a death in the family, or religious observations.

Course Website: All of the course materials will be post on Canvas, including lecture notes, slides, assignment and course daily schedule. Please check the Canvas website daily and finish

the assignment on time.

Grading: Your grade for this course will be calculated as follows.

Weekly Assignment	40%
Quizzes	10%
Midterm Exam	15% *2
Final Exam	20%

Letter grades will be assigned from your overall numerical grade according to the following:

93 ≤ A	87 ≤ B+ < 90	77 ≤ C+ < 80	67 ≤ D+ < 70
90 ≤ A- < 93	83 ≤ B < 87	73 ≤ C < 77	60 ≤ D < 67
	80 ≤ B- < 83	70 ≤ C- < 73	F < 60

Note a 0.3333 will be used for round up. For example, if your score is 92.8, the letter grade will be A. If your score is 86.8, the letter grade will be B+.

Honor code policy: All class work is governed by the College Honor Code and Departmental Policy. It is acceptable and encouraged to discuss assignments with other students. However, all code should be written by yourself. Any code and writeup that is found to be similar is grounds for an honor code investigation.

Every program assignment must have the following comment included at the top of the file.

/* THIS CODE IS MY OWN WORK, IT WAS WRITTEN WITHOUT CONSULTING CODE WRITTEN BY OTHER STUDENTS OR COPIED FROM ONLINE RESOURCES. _Your_Name_Here_ */

An assignment will not be considered turned in without the comment.

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 individual homework unless it's permitted for specific questions, which will be clearly stated.

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 com- promise 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, is willing and available to help.Emory's official list of religious holidays may be found at: http://www.religiouslife.emory.edu/faith traditions/holidays.html.

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.