Department of Electrical & Computer Engineering

CPE 360 – Computational Data Structures & Algorithms

Fall 2022

Course Name:	Computational Data Structures & Algorithms
Credits:	3
Classroom:	Burchard 103
Class Hours:	Tuesday, 11:00 AM – 12:15 PM Thursday, 11:00 AM – 12:15 PM
Office Hours:	Tuesday, 9:00 AM – 11:00 AM or by appointment
Zoom Link & Office hour:	https://stevens.zoom.us/j/98957472683
Instructor:	Hang Liu
Office:	Burchard 307B
Phone:	(201) 216-8103
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TA:	Zhanfu Yang
Office:	Burchard 110
Phone:	(765) 775-0242
Email:	zyang93@stevens.edu
Office Hours:	Thursday, 9:00 AM - 11:00 AM
Zoom link:	https://stevens.zoom.us/j/95280331512

Textbook

Use the internet.
Lecture Notes for Data Structures and Algorithms by John Bullinaria.

Materials

All other materials and slides will be uploaded to course website

Prerequisite Course and Knowledge

- C/C++

Course Description

This course focuses on understanding algorithm complexity, and variety of data structures, ranging from static to dynamic.

Learning Objectives

The objectives are to

- Study big O related complexity notations.
- Introduce static linear data structures, such as array and pointer.
- Learn dynamic linear data structures, e.g., List, Heap, Queue, Stack, Hash table.
- Understand graph data structures, e.g., Tree and graph.
- Learn algorithms, i.e., sorting and graph traversal, that use the prior data structures.

Format and Structure

This course is comprised of weekly lectures, online coding assignments, midterm and final exams.

Course Requirements

Attendance. Students are required to attend all lectures. Four random attendance signoffs will be performed. Each student is permitted one absence per semester without penalty. Excused absences (religious or medical, noted in via email to the professor prior to the absence occurring) accompanied by proper documentation will not lead to point deductions. **100 points possible**.

Homework. There will be three (3) homework assignments throughout this course. Each assignment counts for 100 points. The due time of each assignment is 11:59PM of the due date. 5 points will be deduced each day after the due date. **300 points possible.**

Course format. Data structures and algorithms are practical subjects. Therefore, this course requires all students to *programming while listening to the lecture*. Possible programming environments can be either local or online (e.g., https://www.codechef.com/ide or https://www.onlinegdb.com/online_c++_compiler). This course will also find an effective way to help every student debugging.

Exams. There will be one mid-term exam and final exam for this course; each exam counts for 100 points. Note, there is no makeup exam. Excused absence from any exam shall seek consent from the instructor before the exam day; rearrangement can be scheduled only if a student has a physical problem evidenced by Doctor's prescription. **200 points possible.**

Grading Procedures

Grades will be based on:

- Attendance (10 %) 100 points
- Homework (30 %) 300 points
- Mid-term Exam (30 %) 100 points
- Final Exam (30 %) 100 points

Grade breakdown

A (>=90%),
A- (86 – 89.9%),
B+ (80 – 85.9%),
B (75 – 79.9%),
B- (70 – 74.9%),
C+ (67 – 69.9%),
C (63 – 66.9%),
C- (60 – 62.9%),
F (<60%).

Tentative Course Schedule

The following is a tentative course schedule. Any changes to this schedule will be communicated to students via email. (Refer to Stevens Academic Calendar 2022)

Week	Date	Topic	Note
Week 1	9/1	Welcome, programming interface setup	
Week 2	9/6	C++ basics	Homework 1 out
	9/8	Programming	
Week 3	9/13	List, Recursion, Queue, Stack and Set	
	9/15	Programming	
Week 4	9/20	Searching	
	9/22	Programming	Homework 1 due
Week 5	9/27	Efficiency and Time Complexity	
	9/29	Programming	
Week 6	10/4	Tree and Binary Tree	
	10/6	Programming	Homework 2 out
Week 7	10/11	No Class	Monday Class Schedule
	10/13	Binary Search Tree (BST) and Balanced BST	
Week 8	10/18	Programming	
	10/20	Mid-Term	
Week 9	10/25	Mid-Term Review	
	10/27	Programming	
Week 10	11/1	Priority Queue and Heap Tree	Homework 2 due
	11/3	Programming	
Week 11	11/8	Sorting Algorithm	
	11/10	Programming	
Week 12	11/15	Programming	Homework 3 out
	11/17	Programming	
Week 13	11/22	Hash Table	
	11/24	No Class	Thanksgiving holiday
Week 14	11/29	Programming	Homework 3 due
	12/1	Graph and Graph Traversal Algorithms	
Week 15	12/6	Programming	
	12/8	Programming	
Week 16	12/13	Take Home Final	

Academic Integrity

All Stevens graduate students promise to be fully truthful and avoid dishonesty, fraud, misrepresentation, and deceit of any type in relation to their academic work. A student's submission of work for academic credit indicates that the work is the student's own. All outside assistance must be acknowledged. Any student who violates this code or who knowingly assists another student in violating this code shall be subject to discipline.

All graduate students are bound to the Graduate Student Code of Academic Integrity by enrollment in graduate coursework at Stevens. It is the responsibility of each graduate student to understand and adhere to the Graduate Student Code of Academic Integrity. More information including types of violations, the process for handling perceived violations, and types of sanctions can be found at www.stevens.edu/provost/graduate-academics.

Learning Accommodations

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies. For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/office-disability-services. If you have any questions please contact: Phillip Gehman, the Director of Disability Services Coordinator at Stevens Institute of Technology at pgehman@stevens.edu or by phone (201) 216-3748.

Inclusivity

Name and Pronoun Usage. As this course includes group work and in-class discussion, it is vitally important for the class to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

Inclusion Statement. Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements. Students in this class are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

Questions to Your Grades

You may request the instructor to reevaluate your homework, examinations, course project, and other course materials if you have any question to your course grade. Written request must be submitted to the instructor within two (2) calendar days after the grade was assigned.