



CS 570 PA – Data Structures

Stevens Institute of Technology
Department of Computer Science
Schaefer School of Engineering & Science
Spring 2023

Instructor: Reza Peyrovian

Course Site: Canvas

Course Schedule: Tuesdays 12:30-3:00 PM

Contact Info: rpeyrovi@stevens.edu

Office Hours: Posted on Canvas Homepage

Zoom link: <https://stevens.zoom.us/my/peyrovian> Passcode CCRP

Course Assistants Office Hours will also be posted on Canvas

COURSE DESCRIPTION

This is a course on standard data structures, including sorting and searching and using the Java language. The topics include: programming; testing; recursion; elementary data structures (lists, stacks, queues, and maps); use of elementary data structures in application frameworks; searching; sorting; and introduction to asymptotic complexity analysis.

STUDENT LEARNING OUTCOMES

After successful completion of this course, students will be able to:

1. (C1444): Sets-Maps - Understand what Sets and Maps are, and more specifically implement hash tables in Java. **(Programming Assignment 6)**
2. (C1445): Recursion - Understand, and implement recursive algorithms, and data structures. **(Programming Assignment 4)**
3. (C1446): Abstract Data Types: Understand the notion of Abstract Data Types, and their use in object-oriented designs. **(Programming Assignment 1)**
4. (C1447): Trees - Implement Binary Search Trees, Max/Min-Heaps, Priority Queues in Java, and understand the basic concepts of self-balancing Binary Search Trees **(Programming Assignment 5)**

5. (C1448): Programming - Combine different classes together to implement big programming assignments in Java, including a final project that combines some of the data structures studied in class. **(Programming Assignment 6)**
6. (C1449): Collections - Use and understand Collection class in Java, with major emphasis on Lists, Stacks and Queues. Implement double linked lists in Java. **(Programming Assignment 3)**
7. (C1450) Complexity - Calculate the Big O of diverse non-recursive algorithms and use it to compare efficiency. **(Programming Assignment 2)**

COURSE FORMAT AND STRUCTURE

To access the course, please visit stevens.edu/canvas . For more information about course access or support, contact the Technology Resource and Assistance Center (TRAC) by calling 201-216-5500.

Course Logistics

- You are encouraged to “mentally enroll” in this course as if it occurred on Mondays. In other words, our weeks will run from Monday to Sunday. I will post information about activities for the upcoming week on Monday morning, so that when you log in on Monday, you can begin the new week.
- When assignments are due, they are due by Sunday 11:59 p.m. EST on the due date listed in the course schedule, except Participation Activities that are due by class time; and quizzes that are administered in class.
- Deadlines are strictly enforced. Course requirements must be completed and posted or submitted on or before specified due date and delivery time deadline. Due dates and delivery time deadlines are in Eastern Standard Time (as used in Hoboken, NJ)
- An assignment file should be appended by your username as stated in the assignment. This may make it easier for me to manage assignment files you download to my computer.

Instructor and Assistants Online and Office Hours:

Please try to attend the office hour (Online or physical) of the Course Assistant that grades your Homework Assignments. This will help set the expectations for outcome.

Amount of help provided will be directly proportional to the amount of time left to the due time of assignments. If you show up the day before, we cannot be too helpful. If you show up the day after the assignment is given, we will be extremely helpful.

Office Hours are posted on Course Canvas.

I will be available via email and will respond as soon as I am available (generally within 24 hours except on the weekends. For the online discussions. When emailing me, please place in the subject line the course number/section and the topic of the email (i.e. CS 570 WS— Assignment 2 Question). This will help me tremendously in locating your emails quicker.

The online Office Hours are a synchronous session (through Zoom) to discuss questions related to weekly readings and/or assignments. The link or number and PIN are provided on Canvas along with my Assistants' Office Hours.

While on Zoom with me, do not use the chat for social interaction, but for only course related communication.

TENTATIVE COURSE SCHEDULE

Weeks	Topic(s)	Reading(s)	HW
Week 1	Introduction to Data Structures and Algorithms	Module 1	Participation and Challenge Activities
Week 2	Searching and Algorithm Analysis	Module 2	Homework Assignment 1 Participation and Challenge Activities
Week 3	Lists	Module 3	
Week 4	More Lists	Module 4	Homework Assignment 2 Participation and Challenge Activities
Week 5	Stacks	Module 5	Participation and Challenge Activities
Week 6	Queues	Module 6	Homework Assignment 3 Participation and Challenge Activities
Week 7	Recursion	Module 7	Participation and Challenge Activities
Week 8	More Recursion	Module 8	Midterm Exam
Week 9	Trees	Module 9	Homework Assignment 4 Participation and Challenge Activities
Week 10	Heaps and Treaps	Module 10	Participation and Challenge Activities
Week 11	Hash Tables	Module 11	Homework Assignment 5 Participation and Challenge Activities
Week 12	Sets	Module 12	Participation and Challenge Activities
Week 13	Sorting Algorithms	Module 13	Homework Assignment 6 Participation and Challenge Activities
Week 14	Course Wrap up		Final Exam

COURSE MATERIALS

Textbook:

Zybooks Data Structures (You should purchase your zyBook through Canvas)

Other Readings: Available on Canvas
Materials: Videos on Coding

COURSE REQUIREMENTS

- **Homework:** The programming assignments will be done individually. No collaboration is allowed between students. No code from online resources is allowed to be used besides the code that I will share with you. Any sign of collaboration will result in a 0 and being reported to the Honor Board. Programming assignments might be tested for similarity using the MOSS, or similar software, and any sign of collaboration will be reported to the HONOR board. Students who are caught collaborating for a second time, they will receive a failing grade (F) in the course.

Participation and Challenge Activities: These activities are part of the ZyBook and will be assigned and graded.

Exams: The final exam will be given during the final exam period. An announcement will be posted with more details. The exams will be given on Canvas.

Quizzes: Live Quizzes will be given in most sessions. You must be present to take the quiz.

TECHNOLOGY REQUIREMENTS

Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Canvas

Technology skills necessary for this course:

- Live web conferencing using Zoom

Required Equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Microphone: built-in laptop or tablet mic or external microphone

Required Software

- Microsoft Word
- Java SDK
- Eclipse IDE

GRADING PROCEDURES

Grades will be based on:

Participation Activity	7.5%
Challenge Activity	7.5%
Quizzes	5%

Homework Assignments	60%
Exam (Midterm and Final)	20%

Grading Scheme:

A	100% to	94%
A-	< 94% to	90%
B+	< 90% to	87%
B	< 87% to	84%
B-	< 84% to	80%
C+	< 80% to	77%
C	< 77% to	70%
F	< 70% to	0%

Any complaint regarding a grade must be presented no later than **one week** following the publication of grades of respective assignments. You first need to contact my assistant who graded the assignment. If you could not resolve the issue, then refer it to me. Penalties for specific mistakes that are applied to exams and assignments are equal for all students in the course.

Late Policy

Late assignment (even by one minute) will be given a -10% decrease penalty per day, after the deadline. So, if you send an assignment 1 minute late, you will receive 90% of your grade for the assignment. If you send it, 24 hours, and one minute late, you will receive 80% of your grade for the assignment etc.

Academic Integrity

Graduate Student Code of 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.

Special Provisions for Undergraduate Students in 500-level Courses

The general provisions of the Stevens Honor System do not apply fully to graduate courses, 500 level or otherwise. Any student who wishes to report an undergraduate for a violation in a 500-level course shall submit the report to the Honor Board following the protocol for undergraduate courses, and an investigation will be conducted following the same process for

an appeal on false accusation described in Section 8.04 of the Bylaws of the Honor System. Any student who wishes to report a graduate student may submit the report to the Dean of Graduate Academics or to the Honor Board, who will refer the report to the Dean. The Honor Board Chairman will give the Dean of Graduate Academics weekly updates on the progress of any casework relating to 500-level courses. For more information about the scope, penalties, and procedures pertaining to undergraduate students in 500-level courses, see Section 9 of the Bylaws of the Honor System document, located on the Honor Board website.

EXAM CONDITIONS

The following procedures apply to exams for this course. As the instructor, I reserve the right to modify any conditions set forth below by printing revised Exam Conditions on the exam.

1. Students may use the following materials during exams. Any materials that are not mentioned in the list below are not permitted.

Material	Permitted?	
	Yes	No
Handwritten Notes Conditions: i.e. size of note sheet	x	
Typed Notes Conditions: i.e. size of note sheet	x	
Textbooks Conditions: i.e. specific books	x	
Readings Conditions: i.e. specific documents	x	
Other (specify)		

2. Students are not allowed to work with or talk to other students during exams.
3. Students are not allowed to use any other device to access the internet besides the computer that is used.

LEARNING ACCOMODATIONS

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.

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.

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.

INCLUSIVITY

Name and Pronoun Usage

As this course includes class discussion, it is vitally important for us 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.

You 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.

MENTAL HEALTH RESOURCES

Part of being successful in the classroom involves a focus on your whole self, including your mental health. While you are at Stevens, there are many resources to promote and support mental health. The Office of Counseling and Psychological Services (CAPS) offers free and confidential services to all enrolled students who are struggling to cope with personal issues (e.g., difficulty adjusting to college or trouble managing stress) or psychological difficulties (e.g., anxiety and depression) and who can visit the office in person. CAPS is open from 9:00 am – 5:00 pm Mondays, Wednesdays, Thursdays and Fridays and from 9:00 am – 7:00 pm on Tuesdays during the Fall and Spring semesters; appointments are highly encouraged. For those students who cannot visit the Stevens campus for an in-person appointment, you can contact a local mental health care provider for an in-person appointment, or if you are enrolled in the Stevens Student Health Insurance, you may call Care Connect for 24/7 mental health support at 1-888-857-5462.

For further information please visit the CAPS webpage on Seeking Help Off-Campus: <https://www.stevens.edu/directory/counseling-and-psychological-services/seeking-helpcampus>.

EMERGENCY INFORMATION

In the event of an urgent or emergent concern about the safety of yourself or someone else in the Stevens community, please immediately call the Stevens Campus Police at 201-216-5105 or on their emergency line at 201-216-3911. These phone lines are staffed 24/7, year round. For students who do not reside near the campus and require emergency support, please contact your local emergency response providers at 911 or via your local police precinct. Other 24/7 national resources for students dealing with mental health crises include the National Suicide Prevention Lifeline (1-800-273-8255) and the Crisis Text Line (text “Home” to 741-741). If you are concerned about the wellbeing of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at care@stevens.edu. A member of the CARE Team will respond to your concern as soon as possible.