

Class 1: Introduction

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Contents

Class info

Class Number	CSCI 373-01
	Advanced Data Structures
Instructor	Evan Misshula
Credits	3
Enrollment	29
Semester	Fall 2015

Introduction

Welcome to Advanced Data Structures, Fall 2011. From MIT Open Courseware:

Data structures play a central role in modern computer science. You interact with data structures even more often than with algorithms (think Google, your mail server, and even your network routers). In addition, data structures are essential building blocks in obtaining efficient algorithms. This course covers major results in data structures:

This is the most important class in terms of getting a job as a programmer or developer after school. A substantial portion of any "coding interview" will cover topics from this class. This will allow you to survive the first round of an interview and impress them with your other knowledge. The class will be a success if some of these tools make the rest of your career (research, government or industrial) more productive and enjoyable. The syllabus will

be updated as the course progresses. The schedule is not currently set and will be starting to be updated soon. You are welcome (and encouraged) to make your own recordings of the lectures.

Location and Time

- Where: Rm: 6.64.02, New Building, CUNY John Jay
- When: Tuesdays and Thursdays 11:50-12:05

Computers in the classroom

This is a hands on class. You will be in front of a computer during class throughout the semester. Please feel free to use the computer to take notes or use the class Etherpad to discuss the course material, but do **not** use the computers for non-class related topics.

What is the goal of the class?

- The course goal is for students to learn how to design, write, and analyze C/C++ programs use structured data to perform complex tasks. These tasks are typical of large software projects.
- If the class is successful students will be able to use general principles for data representation & manipulation. They will write efficient, maintainable and modular code.
- If the class is successful students will be able to analyze abstract data types such as vectors, lists, deques, trees, etc.
- If the class is successful students will be able to use techniques such containers, adaptors, accessing data through interface, iterators and tail-recursion.
- If the class is successful students will be able to analyze algorithms using Big-0 notation.

What will be covered?

All of the technologies have been chosen to be readily available and likely to be around for many years to come. You will gain experience with the following (do not worry if you have not heard of some or all of these). Because this is a one semester class, we will not be able to go into depth on these topics, but this should provide the foundation for you to learn more when you need or want to.

Note: this is not the order that we will cover the material and we might not get to all of these in class.

1. Structs and classes
2. Overload operators
3. Class templates
4. Abstract data types
5. Pointers and dynamic arrays
6. Implementing an array class
7. Methods for making data structures
8. Stacks and queues
9. Hash tables
10. Priority queues
11. Tree structures
12. Heaps
13. Recursion and Sorting
14. Sorting
15. Binary Search Trees and Graphs

Grades

There will be weekly homework. The problems will be difficult. Successful completion of all homework should guarantee a grade of 'A'. In addition there will be a midterm and final exam in case students are struggling. Be warned, this is a demanding class.

The general rule of thumb regarding college studying is, and has been for a long time, that for each class, students should spend approximately 2-3 of study time for each hour that they spend in class. Many students carry a course load of 15 credits, or approximately 15 hours of class time each week.

<http://bit.ly/1wwrUR1>

If students are spending considerably more than 7.5 hours per week on the homework, they are advised to speak with the instructor and adjustments will be made. If you put in the time, there is no reason not to get an outstanding mark. Do not try to game the system by not doing the homework and making it up on the exams. That strategy has not been successful yet.

ATTENDANCE POLICY

Students enrolled in this course are required to attend all lecture, recitation and laboratory sessions of the section for which they registered. In general, there are two one period lecture sessions, a one period recitation session and a two period laboratory session each week. (During summer session, two weeks of classes are covered each calendar week.) Excessive absences (defined above) will result in a reduction in the grade. Attendance is taken solely from roll sheets circulated at the beginning and/or end of each session. Lateness or early departure (resulting in missing no more than 15 minutes of a session) counts as 1/2 absence. Students missing more than 15 minutes of a session will be counted as absent. Students missing safety instructions in lab will be marked absence and prohibited from doing the exercise for their own safety and the safety of the other students in the lab. If the college is officially closed, thereby canceling all classes, an announcement will be found on 237-8000, and broadcast on AM stations WINS (1010), WOR (710), WCBS (880), WADD (1280), WMCA (570), WLIB (1190), and WFAS (1230), as well as FM stations WCBS (101.1) and WBLS (107.5). If a class will be cancelled for extraordinary circumstances, the instructor will email an announcement to the preferred email of enrolled students as soon as practicable. This has not happened in recent memory.

ACTIVE COLLEGE E-MAIL

Students are expected to maintain active and accessible college email and Blackboard accounts. Blackboard will be used to send emails and may be used to post announcements, handouts, additional study materials, text supplements, grades, etc. Use the CUNY Portal Login page help features for a forgotten username or password, or contact DoIT, 212-237-8200 for other help. Verify your CUNY email address is correctly listed on Blackboard and keep the mailbox from filling up and refusing delivery, because you will be responsible for the contents of any email sent to that account.

When emailing instructors for this course, start the email's subject line with the course and section number (e.g., CSCI 372-01) followed by a brief description. Include your full name in the body of every email. Emails that do not contain these descriptive details may be considered spam, and remain unopened and unanswered. Students are expected to check email regularly.

TUTORING

Although a considerable amount of remediation is done during the course, when necessary students are encouraged to attend—on a first come, first served basis—free tutoring offered to students requesting such help. Scheduled weekly or biweekly appointments are encouraged. “Crash” sessions immediately before an exam are discouraged. A student who fails an exam or homework (less than 60.00%) is required to sign into and attend at least one hour of tutoring weekly until the next exam. An additional hour of tutoring is required for every seven days, or part thereof, homework is past due. (The homework must still be completed.) Failure to sign in and attend required tutoring and provide attendance documentation counts as a recitation absence per occurrence. Attendance at tutoring is automatically forwarded to the instructor by the Math and Science Resource Center.

Contact Information for the MSRC: Room: 01.94 NB: Phone: (646) 557-4635 Email: msrc@jjay.cuny.edu MSRC Website: <http://www.jjay.cuny.edu/academics/592.php> TutorTrac (for scheduling appointments): <https://jjctutortrac.jjay.cuny.edu>

ADA STATEMENT: STUDENTS WITH DISABILITIES

Qualified students with disabilities will be provided reasonable academic accommodations if determined appropriate by the Office of Accessibility Services (OAS), 212- 237-8031, located in room L.66.00. Prior to granting disability accommodations, verification of a student's eligibility must be timely received from OAS by the math department chairman, Professor Douglas Salane (dsalane@jjay.cuny.edu), and the instructor, from the OAS. It is the student's responsibility to initiate contact with the OAS and to follow the established procedures for having the accommodation notice sent to both the course coordinator and the instructor.

ACADEMIC INTEGRITY:

Students who succeed in this course and graduate with a degree in Computer Science and Information Security may be hired by government or private agencies to analyze evidence and testify in a court of law, placing in jeopardy another person's reputation and/or liberty. Dishonesty of any kind cannot and will not be tolerated. Students are expected to become thoroughly aware of the "John Jay College Policy on Academic Integrity" (and other college policies), available on the college's Web site. Sanctions to the extent permitted by the policy will be imposed and any written material submitted may be transmitted by the instructor to Turnitin.com (or equivalent service) to help analyze its originality. See the Undergraduate Bulletin for the College's Policy on Plagiarism and Cheating, which will be strictly enforced. Plagiarism includes copying ASA or homework answers from others. You are required to do your own work to avoid severe grade and disciplinary penalties. The College subscribes to Turnitin.com and Blackboard has a similar module called SafeAssign. Any written assignments submitted may be subject to evaluation by these or similar programs.