

CS 401: Introduction to Advanced Studies I

Department of Computer Science
Illinois Institute of Technology

This course explores the implementation and application of fundamental data structures and algorithms, with an emphasis on object-oriented programming. During the semester, we will examine the relationship between these elements and the mathematical structures that form the foundation of computer science. By the end of the semester, the student should be able to determine which class of data structures is appropriate for a given problem and be able to describe the performance characteristics and limitations of their choice.

The course uses Java as a programming language. It is expected that enrolled students know programming in general and Java in particular. Students can enroll if they know C++ and are willing to self-learn Java during the first four weeks of the semester.

Prerequisites of the class are CS201 or a CS401 placement test.

Instructor: Dr. Vijay K. Gurbani <vgurbani@iit.edu>

Office hours: By appointment.

Course home page: <http://www.cs.iit.edu/~cs401> and resources on the Blackboard system.

TA and lab instructor: Mr. Wei Tang <wtang6@iit.edu>

TA office hours: 3:00p - 5:00p, Tue and Thu.

TA office location: Stuart Building, SB 004

Lecture and Labs

Tue 6:25p – 8:05p – Lecture, Rice campus and IIT/V (main campus and Internet)

Thu 6:25p – 8:05p – Laboratory

Textbooks

1. Object-oriented data structures using Java, 2e, Nell Dale, Daniel T. Joyce and Chip Weems. Jones and Bartlett Publishers, 2006 **(Required)**
2. Data structures in Java: A laboratory course, Sandra Andersen Jones and Bartlett Publishers, 2002 **(Required)**

Expectations

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources and make an appointment to speak with me as soon as possible. The Center for Disability Resources (CDR) is located in Life Sciences Room 218, telephone [312-567-5744](tel:312-567-5744) or disabilities@iit.edu.

Students are expected to adhere to IIT's academic integrity policy. Inter-personal discussion is encouraged, however, while inter-personal discussions can help in better understanding the subject matter, such discussions are not to be used as a substitute for sharing solutions on individual homework and laboratory assignments. Homework assignments or laboratory assignments that are the work of one individual and shared with others will result in all affected students receiving a zero (0) grade for that particular assignment.

There will be laboratory assignments throughout the semester. The assignments would occur on a Tuesday and a due date will be established (typically, a week or two later.)

Assignments are expected to be completed by the due date and submitted using Blackboard. The time stamp on the assignments is expected to be no later than **11:59:59 PM local time on the day that the assignment is due**. Each day that the assignment is submitted late will result in a penalty of 1 point; an assignment that is submitted more than 3 days late will not be accepted.

You can do the laboratory assignment on any operating system (Linux, Unix, Windows), using any IDE (Eclipse) or no IDE (command line compilation). The TA will provide further instructions during the first laboratory period on using Eclipse and compiling Java programs. It is expected that the student has spent substantial amount of time attempting to solve a laboratory assignment before arriving for the laboratory session each Thursday. Attendance at the laboratory session is mandatory as this is the time the TA will be available for extra help if you are struggling with the material (in Sections 01 and 02.)

There will also be a series of discussion groups throughout the semester, conducted through Blackboard. Participation in the discussion groups is mandatory, and a portion of your grade depends on the discussion group. The discussion groups will include papers to review, assigned questions from the textbook and in-depth look at certain aspects of learning the data structure. When I will assign you a paper relevant to the data structure or lecture being studied, my expectations are that you will read the paper, review it, and in addition, critique the review of your peers. For assigned questions, I want you to see where your peers went wrong and open up a discussion thread on any aspects of the question that you want to discuss with a wider audience. Since the class also contains students participating remotely, the discussion groups are essential in fostering inter-peer collaboration and thoughts.

The lecture is simulcasted to the Main campus from the Rice campus and also provided as a streaming web resource for overseas students. Attendance in lectures for Main campus students is mandatory in order to keep up with the subject material of the class.

There will be a mid-term exam and a final exam. These are closed book and individual effort assignments. Any sharing of resources or subject matter during the exams will result in a penalty for all affected students. Attendance to these exams is mandatory and there are no provisions for make-up exams.

That is it. Have fun; programming is an immensely enjoyable and creative activity. I hope you are able to be creative and have fun while doing so.

Schedule

Week/Lecture Date	Chapter	Laboratory	Notes
1/Aug 24	Ch. 1	Lab. 1: Warm up lab	
2/Aug 31	Ch. 1/2	Lab. 2: To be assigned	
3/Sep 7	Ch. 6	Lab. 3: Singly linked lists	
4/Sep 14	Ch. 6/7	Lab. 4: Doubly linked lists	
5/Sep 21	Ch. 3	Lab. 5: Stack	
6/Sep 28	Ch. 4	Lab. 6: Linked lists and recursion	
7/Oct 5	Ch. 4/5	Lab. 7: Queue	
8/Oct 12	Ch. 5 (continued)		Assign semester project
9/Oct 19	Mid-term	No Lab	
10/Oct 26	Ch. 8	Lab. 8: Binary search tree	
11/Nov 2	Ch. 8 (continued)		
12/Nov 9	Ch. 9	Lab 9: Heaps	
13/Nov 16	Ch. 9 (continued)	Lab 10: Graphs	
14/Nov 23	Ch. 10	Lab 11: Performance evaluation	
15/Nov 30	Ch. 10 (continued)		
16/Dec 6	Finals week		

Performance Assessment

Standard grading scale applies:

90-100 – A, 80-89 – B, 70-79 – C, 0 <= E <= 69.

Grade distribution

Final Project	08%
Laboratory assignments	44%
Mid-term	20%
Final exam	20%
Blackboard Discussion	08%

