

Southern Illinois University Carbondale
CS 220: Programming with Data Structures
Spring 2008

Course Objectives

- Become familiar with data structures such as lists, stacks, queues, trees, graphs and their variations.
- Learn techniques for implementing these fundamental abstract data structures.
- Introduction to various applications of data structures.
- Provide an in-depth coverage of recursion, sorting and searching techniques.
- Discuss object-oriented programming concepts such as encapsulation, inheritance and polymorphism.
- Introduce hashing techniques
- Analyze the efficiency of various implementations of data structures (complexity analysis in Big Oh Notation).

Prerequisites

CS 202 and CS 215, with a grade of C or higher.

Meeting Times

10:00am – 10:50am M, Lindegren 18
10:00am – 10:50am WF, Parkinson 107

Course Homepage

You can use Blackboard system to download and upload home works and lab projects. Go to <http://www.cs.siu.edu/~mengxia/teaching.html> for lecture slides

Course Personnel

Instructor: Mengxia Zhu

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Hours: 1:00pm—3:00pm MWF and by appointment

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Hours: 1:00pm – 4:00pm Tuesday and Thursday and by appointment

Text

Lecture slides and reading materials can be downloaded from the course website. **Required** textbook is: *Data structures and Abstractions with Java*, Second Edition, by Frank M. Carrano, Pearson/Prentice Hall ISBN: 0-13-237045-X.

Grading

Lab assignments (4): 30%

Homework sets (6): 20%

Exams (3): 50%

Course Policy

1. **Attendance.** Due to the nature of the course and the frequency of assignments, attendance is mandatory. You are responsible for all announcements and for all material presented in the lectures. Come prepared for class. Read the assigned material in advance of lectures. If you have to miss class, please consult with your class members so that you can find out what happened in class.
2. **Assignments.** There are 4 lab assignments and 6 homework sets. Lab assignments involve programming, and homework sets contain questions that require written answers. Additional help sessions for each lab assignment may be scheduled after the assignment is posted. Please make sure that your programs are properly documented and indented. Your solution to the homework sets can be hand-written or typed. You must talk to the instructor, not the TAs, for any grade appeal about an assignment, and it must be made within one week after the assignment is handed back.
3. **Exams.** There will be two midterm exams and one final exam, midterms last 1.5 hours and 2 hours for the final. All exams are closed-book (unless otherwise specified) but not comprehensive except the final. Additional Q&A sessions may be scheduled prior to the exams. The time and location of the two midterm exams are to be announced. There will be no make-ups except under very special circumstances. Any reason for a make-up must be approved by the instructor.
4. **Programming Environment.** All programs in lab assignments must compile and run in the J2SE JDK 5.0 environment. You may use any IDE you prefer, but we recommend that you use NetBeans, DrJava or BlueJ. All of the necessary software can be freely installed on your PC. For any technical questions regarding software installation, lab assignments, Java programming, and development environment, please consult the TAs first.
5. **Collaboration and Plagiarism.** All homework and lab assignments are to be done individually unless otherwise specified. You are allowed and even encouraged to *verbally* discuss the assignment material with your classmates or consult others for debugging assistance, but you must prepare the solution on your own. Plagiarism and other anti-intellectual behavior are not tolerated and are subject to severe penalties. For more information, please carefully read the Departmental Policies on Academic Dishonesty available at <http://www.cs.siu.edu/departement/cheating.html>.
6. **Time Management.** This course is an extremely time-demanding course. Please plan your time wisely, and start work on the assignments as soon as they are available.

Nevertheless, this course is probably the most important and useful course in your computer science education.

Tentative Schedule

Dates here are subject to change, and are provided only as a general guideline.

Week	Topic
1	Review of programming principles Review of Java fundamentals
2	Review of Java fundamentals Object-oriented Programming
3	Object-oriented Programming
4	Recursion
5	Lists
6	Lists Algorithm Efficiency
7	Algorithm Efficiency
8	Sorting and Searching
9	Sorting and Searching Queues
10	Queues Stack
11	Stack Heap
12	Heap Hashing
13	Graph
14	Graph
15-16	Selected advanced topics