Data Structures
CS 260-002 Fall 2003

Course Description and Syllabus
Instructor: Krzysztof Nowak
Office: Korman 236
Office Hours: Monday, Wednesday, Friday 10:00 am - 10:50 am (or by an appointment)
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Section 002: Monday, Wednesday, Friday 1:00 pm - 1:50 pm Matheson 306
Prerequisites: CS 171, CS 172

Data Structures is a Computer Science domain, which deals with the organization of data. Modern programming makes use of the following basic structures of data representation: linked lists, stacks, queues, trees and graphs. The course deals with implementations of these data structures and with algorithms, which allow one to operate efficiently on them. We cover theoretical concepts and methods, which are necessary in the process of design and evaluation of algorithms. Our presentation of the topic will follow the steps:

- Abstract understanding of data types
- Design and implementation
- Analysis of correctness, flexibility and efficiency

One of the learning objectives of the course is to encourage the students to use pictorial representations of data structures and algorithms. Homework will be assigned on weekly basis. It will consist mostly of programming problems and tasks related to analysis of algorithms. Two midterms and the final exam are planned. The prerequisites for the course are computer-programming courses CS 171, CS 172.

Required Text
Michael Main, Walter Savitch, Data Structures and Other Objects Using C++
Addison-Wesley, 2001 (Second Edition)
Reference Texts

Syllabus
**Week 1**: An overview of basic features of C++
**Week 2**: Pointers, dereferencing operator, address operator, pointers as value and reference parameters, dynamic arrays, operators new and delete
**Week 3**: Linked lists: the structure of nodes, the member selection operator, building and manipulating linked lists
**Week 4**: Review 1, Midterm 1
**Week 5**: Standard Template Library of C++, algorithms based on recursion
**Week 6**: Trees: representations, implementations & algorithms
**Week 7**: Stacks and related algorithms
**Week 8**: Queues, Review 2, Midterm 2
**Week 9**: Searching, sorting
**Weeks 10,11**: Sorting continued, hashing, Final Review

Course Grade and Exams
There will be two midterm exams and the final. The final exam will be comprehensive. The final grade will be computed as follows:

- Midterm Exams 35%
- Final Exam 30%
- Homework/Programming Assignments 30%
- Attendance 5%
Course Website

Midterm 1: 10/17/03
Midterm 2: 11/14/03