

# Syllabus

AS/AK/ITEC 2620 3.0

Introduction to Data Structures

Section M, Winter 2003

Instructor:	Prof. S. Chen
Tutorials:	Mondays, 4:30 - 5:30 pm in CSB A
Office Hours:	Mondays, Tuesdays, and Thursdays, 5:30 - 6:00 pm in CCB 152
TAs:	Harmeet Brar, Andre Garde, Stephen Morris, Jian Zhou
Classroom:	Computer Science Building, Theatre A
Time:	Tuesdays and Thursdays, 4:00 - 5:30 pm
Lab:	ITEC common image (CLAS, GLADE, etc)
Final:	TBA
Textbook:	A Practical Introduction to Data Structures and Algorithm Analysis – Java Edition, Clifford A. Shaffer
Homepage:	<a href="http://www.atkinson.yorku.ca/~sychen">http://www.atkinson.yorku.ca/~sychen</a>

## Course Description

This is an introductory course in algorithms and data structures. This is not a course in JAVA programming – it is assumed that you already know how to program. Thus, JAVA can now be used as a language to communicate more advanced and abstract ideas. These ideas are part of what separate good programmers from mere coders.

## Textbook

The required text is “A Practical Introduction to Data Structures and Algorithm Analysis – Java Edition” by Clifford A. Shaffer. I should warn you that you may find the book hard reading, but I hope you will find it insightful and worthwhile.

## Important Dates

There will be no classes on February 18 and February 20 for Reading Week.

## Evaluation

Programming project 1 (due 2/24):	10%
Programming project 2 (due 3/31):	10%
Midterm (on 2/27):	30%
Final (TBA):	50%

For grade conversion, please see

<http://calendars.registrar.yorku.ca/calendars/2001-2002/ugfiles/acad/3.htm>

## Late Policy

Late assignments will NOT be accepted unless medical or other acceptable documentation is supplied. Such documentation must indicate that:

- some problem prevented you from working on the task for at least 50% of the time that you had to do it.

If approved, the weight of the assignment will be added to the weight of the final exam. A make-up midterm will NOT be provided. If you miss the midterm for an approved excuse, the weight will be added to the weight of the final exam.

## Academic Honesty

Computer programs are the equivalent of essays. While you are encouraged to work with classmates as part of your educational experience, you must submit **independent** work – nothing that has been copied electronically. The penalty for submitting a copied program is zero for that program and an additional penalty of 5% deducted from your final grade.

## Lecture Topics

<u>Lect</u>	<u>Day</u>	<u>Topic</u>
1a	1/7	Introduction
1b	1/9	Searching
2a	1/14	Sorting – non-recursive algorithms
2b	1/16	Estimation and Complexity analysis – non-recursive algorithms
3a	1/21	More complexity analysis, Complexity estimation – non-recursive algorithms
3b	1/23	Linked lists
4a	1/28	Doubly linked lists and Binary trees
4b	1/30	Recursion and Binary tree operations
5a	2/4	Sorting – recursive algorithms
5b	2/6	Programming project 1 discussion
6a	2/11	Complexity analysis – recursive algorithms
6b	2/13	Complexity estimation – recursive algorithms
		< READING WEEK >
7a	2/25	Abstract datatypes and Stacks
7b	2/27	MIDTERM
8a	3/4	Queues, Priority Queues
8b	3/6	Heaps
9a	3/11	Search trees
9b	3/13	Grammars
10a	3/18	Grammars
10b	3/20	Programming project 2 discussion
11a	3/25	Graphs and Graph algorithms
11b	3/27	Game trees
12a	4/1	Hashing
12b	4/3	Review

## Suggested Readings from Shaffer

<u>Lect</u>	<u>Topics</u>	<u>Sections</u>
1a	Introduction	1.1, 1.3-1.5
1b	Searching – linear search, binary search	pages 42, 60-62, 10.1
2a	Sorting – insertion sort, bubble sort, selection sort	8.1, 8.2
2b	Complexity analysis	2.5, 2.7, 3.1, 3.3-3.5
3a	More complexity analysis	3.2, 3.6-3.9
3b	Linked lists	4.1-4.1.4
4a	Doubly linked lists and Binary trees	4.1.5, 5.1, 5.3.1, 5.5
4b	Recursion and Binary tree operations	2.4, 5.2,
5a	Sorting – quicksort, mergesort	8.4, 8.5
5b	Binary search trees	5.5
6a	Complexity analysis – recurrence relations	2.5, 14.2.2
6b		
7a	Abstract data types and Stacks	1.2, 4.1, 4.2
7b		
8a	Queues, Priority Queues	4.3, 5.6
8b	Heaps, Heapsort	5.3.3, 8.6
9a	Breadth-first search, Depth-first search	7.3.1, 7.3.2
9b		
10a		
10b		
11a	Graphs and Graph algorithms	7.1, 7.4, 7.5
11b		
12a	Hashing	10.4
12b		