COMP 4030-6030 Introduction to Algorithms – Spring 2006

Junmei Zhu, Ph.D.

Contact Information:

Office: 216A Dunn Hall	**Department Office:** 209 Dunn Hall
Phone: 678-1539	**Department Phone:** 678-5465
E-mail: jzhu@memphis.edu	

Office Hours:

Monday	Tuesday	Wednesday	Thursday	Friday
		2-4		
Also by Appointment				

Course Description:

COMP 4030-6030 (3). Asymptotic behavior of programs, basic paradigms in algorithm design; greedy, divide-and-conquer, dynamic programming; analysis of efficiency and optimality of representative algorithms, including graph, pattern matching, numerical, randomized, and approximation algorithms; approaches to lower bound analysis; basic parallel algorithms. PREREQUISITE: COMP 3160.

Why this course?

This course introduces students to the analysis and design of computer algorithms.
Upon completion of this course, students will be able to

- Analyze the performance of algorithms
- Explain the major problems, their representative algorithms and analyses
- Apply important algorithmic design paradigms and methods of analysis
- Feel they are real computer science students

Resources:

Required Text [CLR] T.H.Cormen, C.E Leiserson, R.L. Rivest, and C. Stein,
Introduction to Algorithms,
Second Edition, MIT press and McGraw-Hill, 2001.

Recommended Texts Sara Baase and Allen Van Gelder,
Computer Algorithms: Introduction to Design & Analysis,
Third edition, Addison-Wesley, 2000 (on reserve).

Other Resources: See course webpage.

Evaluation:

Final Grades:

	4030	**6030**
Pop quizzes	10%	10%
Midterm	30%	30%
Final	40%	40%
Assignments	20%	15%
Bonus project	5% (bonus)	5% (mandatory)

Grading Scale:

Final letter grades will be assigned based on performance relative to the rest of the class.

Course Policies:

Attendance

Your active participation in class (participating in class discussions, asking relevant questions, volunteering to provide answers to questions) is crucial in making the course successful. If there's something that you do not understand, please feel free to interrupt the lecture with questions. If you miss a class, it is your responsibility to find out what we talked about, including announcements we made in class.

Late Policy

No makeup exams. No late homework is accepted and you will get zero credit for it. The only exception is when you have an emergency, with a note that verifies the problem before the due date, in which case you have a 48-hour grace period at the cost of 50% of the grade.

Collaboration Policy

I encourage students to study together. However, all work submitted for the class is to be done individually.

Special needs

Students with special needs should see me to discuss necessary accommodations as early as possible.

Problems and concerns

It is very important to me that you voice your concerns about any aspect of the class as soon as they arise. Please email me, call me, or talk to me in person. I will accept anonymous notes and treat them seriously, as long as they are sincere and constructive. Your comments will have an effect on the class, so please do not be hesitant to provide them.

Plagiarism/Cheating Policy:

Plagiarism or cheating behavior in any form is unethical and detrimental to proper education and ***will not be tolerated.*** All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but ***appropriate references must be included for the materials consulted***, and appropriate citations made when the material is taken verbatim.

If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to:
http://www.people.memphis.edu/~jaffairs/

Course Syllabus

Lecture	Date	Lecture Topics
1	1/18	Introduction
2	1/23	Algorithm analysis
3	1/25	Time complexity functions
4	1/30	Recurrences (1)
5	2/1	Recurrences (2)
6	2/6	Sorting (1)
7	2/8	Sorting (2)
8	2/13	Sorting (3)
9	2/15	Selection (1)
10	2/20	Selection (2) / adversary argument
11	2/22	Graph traversals (1)
12	2/27	Graph traversals (2)
13	3/1	Midterm
14	3/6	Spring break
15	3/8	Spring break
16	3/13	Graph traversals (3)
17	3/15	Graph optimization and greedy algorithms (1)
18	3/20	Graph optimization and greedy algorithms (2)
19	3/22	Graph optimization and greedy algorithms (3)
20	3/27	String matching – KMP
21	3/29	String matching – Boyer-Moore

22	4/3	Dynamic programming (1)
23	4/5	Dynamic programming (2)
24	4/10	Dynamic programming (3)
25	4/12	Intro to NP-completeness
26	4/17	Bin-packing/knapsack
27	4/19	Approximation algorithms
28	4/24	Catch up
29	4/26	Last day of classes, review

(A rough guideline, subject to change)