CS275 Discrete Mathematics
Fall 2007 (TR 3:30 - 4:45pm, CB 238)

Instructor: Prof. Fuhua (Frank) Cheng
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Office hours: MW 2:00-4:00pm
and by appointment

Teaching Assistant: Jianzhong Wang
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Office Hours: M 11am-12pm, WF 12-1pm

Text: Discrete and Combinatorial Mathematics, 5th Edition
(Author: Ralph P. Grimaldi Publisher: Pearson/Addison-Wesley)

Grading Policy*:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework (8-10)</td>
<td>40%</td>
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<tr>
<td>Midterm I</td>
<td>20%</td>
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<tr>
<td>Midterm II</td>
<td>20%</td>
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<tr>
<td>Final</td>
<td>20%</td>
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* A midterm grade (based on Midterm I and first part of Homework) will be turned in for each student in this class.

Late Penalty:
I do not accept late programs or homework.

Cheating and Plagiarism:

Plagiarism and cheating are serious academic offenses. The minimum penalty for those academic offenses is final grade E in the course. The university regulations pertaining to this matter can be found at
http://www.uky.edu/StudentAffairs/Code/
Of particular relevance is Part II, SELECTED RULES OF THE UNIVERSITY SENATE GOVERNING ACADEMIC RELATIONSHIPS, Section 6.3 that can be found at
http://www.uky.edu/StudentAffairs/Code/part2.html
(These rules in particular say:
6.3.1 PLAGIARISM All academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, or self-expression. In cases where students feel unsure about a question of
plagiarism involving their work, they are obliged to consult their instructors or the matter before submission. When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the source, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else’s work, whether it be published article, chapter of a book, a paper from a friend or some file, or whatever. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student and the student alone.

When a student’s assignment involves research in outside resources or information, the student must carefully acknowledge exactly what, where, and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content, and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain.

6.3.2 CHEATING Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. Any question of definition shall be referred to the University Appeals Board.

I want to emphasize that in this class students are allowed to discuss ideas and are allowed to help others by explaining concepts and possible solutions. However, all the work that is submitted must be performed by the students individually. Any sharing of electronic files, printouts and other materials developed by the students is not allowed. If any fragments of text appearing in books, journals, conference proceedings, web pages, etc. are used, students must provide appropriate citations. Any help from others must also be acknowledged.

**Scale:**

| 88 -100 | A  |
| 78 - 87 | B  |
| 68 - 77 | C  |
| 58 - 67 | D  |
| 0 - 57  | E  |

**Course Description:**

This course covers topics in discrete math aimed at applications in Computer Science. For fundamental principles, we cover: set theory, induction, relations, functions and Boolean algebra. For techniques of counting, we cover: permutations, combinations, recurrences, and algorithms to generate them. This course will also do an introduction to graphs and trees.
Learning Outcomes:
Students will develop a knowledge of a variety of mathematical tools applicable in computer science. Specifically, students will be able to
1. construct inductive proofs
2. apply set algebra
3. apply elementary logic
4. enumerate combinatorial objects
5. solve recurrence relations

Measures: These five specific outcomes will be evaluated on the basis of student work (homeworks, programs and exams) that will contain problems specifically addressing these outcomes. They will also be evaluated on the basis of student self-assessment of their mastery of the five outcomes performed at the end of the semester.

Course Contents:
1. Fundamental Principles of Counting (Permutations and combinations)
2. Fundamentals of Logic
3. Set Theory
4. Mathematical Induction
5. Relations and functions
6. Recurrences
7. Inclusion and Exclusion
8. Graphs and Trees
9. Boolean Algebra
10. Switching Functions*

* Optional

Important Dates:

First Midterm 9/27/07 (Thursday)
Last day to withdraw from a course 10/19/07 (Friday)
Second Midterm 11/8/07 (Thursday)
Fall break and Thanksgiving Holidays 11/21/07-11/24/07
Last day of classes 12/7/07 (Friday)
Final Exam 12/13/07 (Thursday 3:30 pm)