CSE547, AMS547 Discrete Mathematics Spring 2007

Professor Anita Wasilewska

Meets Tuesday Thursday 9:50 am - 11:10 am
Place Physics 125

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Professor Office Hours Tuesday, Thursday 1:30 -3 pm and by appointments.

Textbook
  CONCRETE MATHEMATICS
  A Foundation for Computer Science
  Graham, Knuth, Patashnik
  Addison- Wesley

Lecture Notes on Discrete Mathematics

Course Description The course will have two parts: Concrete Mathematics as presented in the textbook and Abstract Mathematics. My detailed Lecture Notes are on RESERVE in Computer Science Library.

Concrete Mathematics is "a controlled manipulation of (some) mathematical formulas using a collection of techniques for solving problems" (textbook introduction). Original textbook was an extension of "Mathematical Preliminaries" of Knuth book of ART OF COMPUTER PROGRAMMING. Concrete Mathematics is supposed (and hopefully will) to help you in the art of writing programs, or thinking about them.

The second part of the course will cover some chosen topics in Discrete Mathematics.

Grading There will be:

1. Homework Presentations In class presentations of assigned homework problems (75pts total).
   Students will be graded for the presentation clarity, skills, the content, organization, and amount of work put into preparation.
   The presentations will cover all of assigned homework problems.
   Each student will have to give 2 presentations (25pts each) during the semester. They must be from different homework assignments.
   Students are responsible for solving ALL Homework problems. The knowledge of Homework problems solutions will be tested by Homework Presentations and Midterm and Final tests.

2. Midterm (75pts). It is an open book test. Covers Homework assignments and in class examples.
3. **Final** (75pts). Covers all material, open book.

**Examinations** will be based on homework problems and examples from the book.

**Final grade computation** During the semester you can earn 200pts or more (in the case of extra points). The grade will be determined in the following way: 
\[
\text{# of earned points divided by } 2 = \% \text{ grade.}
\]

The grade will be determined in the following way: of earned points = \% grade. The \% grade which is translated into letter grade in a standard way i.e. 100 - 90 \% is A range (A, A-), 89 - 80 \% is B range (B-, B, B+), 79 - 70 \% is C range (C-, C, C+), 69 - 60 \% is D range and F is below 60%.

**Course Contents and Schedule**

The course will follow the book very closely and in particular we will cover some, or all of the following chapters and subjects.

- **Chapter 1** Recurrent Problems
- **Chapter 2** Sums
- **Chapter 3** Integer functions (reading)
- **Chapter 4** Number Theory
- **Chapter 5** Binomial Coefficients pp 153-204
- **Chapter 6** Special numbers pp 243-264
- **Chapter 7** Generating Functions (if there is time)

**Part Two:** Discrete Mathematics - TBA

**Homework Presentations and Assignments**

**Homework Presentations** must be formal, POWER-POINT presentations.

**All students** must give me copies of their presentations before the presentation.

Each student must give **two homework solutions** presentations during the semester.

**Homework solutions** presentation (25p) must contain one problem chosen from different Homework assignments listed below, or any other problem from corresponding Chapters.

**Presentation scheduling** is on "first come, first serve" basis.

Please e-mail Professor your choices of problems as soon as possible.

**HOMEWORK 1: Chapter 1**

**PROBLEMS**

**P1** Write details of pp 12-13 discussion of cyclic properties of \( J(n) \) and the false guess that \( J(n) = \frac{n}{2} \).

**P2** Write details of pp 15-16 binary solutions to generalized recurrence.
P3, P4 Write a detailed solution to problems 6, 7 on page 17.

P5, P6, P7 Write a detailed solution to problems 8, 9, 11, respectively, on page 18.

P8 Write a detailed solution to problem 16 on page 19.

P9 Write a detailed solution to problem 20 on page 19.

P10 Write a detailed solution to any other problem on pages 19-20.

HOMEWORK 2: Chapter 2

PROBLEMS

P1 Write and present a detailed solution to problems 3, 4.

P2 Write and present a detailed solution to problems 5, 7.

P3 Write and present a detailed solution to problems 8, 9.

P4 Write and present a detailed solution to problems 13, 14.

P5 Write and present a detailed solution to problem 15.

P6 Write and present a detailed solution to problems 16, 17.

P7 Write and present a detailed solution to problem 19.

P8 Write and present a detailed solution to problems 20, 21.

P9 Write and present a detailed solution to problems 23, 24.

P10 Write and present a detailed solution to problems 27, 29.

HOMEWORK 3: Chapter 5


HOMEWORK 4 on Discrete Mathematics material to be assigned.

HOMEWORK PRESENTATIONS AND TESTS SCHEDULE

Homework 1 Thursday, February 8, in class

Homework 2 Thursday, March 8, in class

MIDTERM Thursday, March, 15, in class

Homework 3 Thursday, April 19, in class

Homework 4 Thursday, May 3, in class

FINAL t.b.a follows University Schedule