

# CSE547, AMS547 Discrete Mathematics Spring 2011

Professor Anita Wasilewska

web page: <http://www.cs.stonybrook.edu/~cse547/>

**Meets** Tuesday, Thursday, 11:20 AM - 12:40 PM

**Place** CS 2311

## Professor Anita Wasilewska

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**Professor Office Hours** Tuesday, Thursday 3:00 - 4:00 pm and by appointment.

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**TA Office Hours** tba

## Textbook

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

**Course Lecture Notes** are in the Course Web Page Downloads

**Course Description** The course will have two parts: Concrete Mathematics as presented in the textbook and Concrete Mathematics is "a controlled manipulation of (some) mathematical formulas using a collection of techniques for solving problems" (textbooks introduction). We will cover book chapters 1- 5.

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 Number Theory and classical Discrete Mathematics, if time permits.

**Grading** There will be TWO MIDTERMS and a FINAL examination. There also will be assigned sets of homework problems students must work out and learn for the tests. The complete solutions to all problems are posted on the course webpage. The book also contains majority of solutions but they are are not complete.

**Homework Problems** There will be three, or four Homework problems sets. NONE will be collected or graded. Solutions (very short) of all homework problems are in the text book.

For the TEST students are responsible for working out and writing DETAILED solutions explaining all steps and methods used, as it is done in our Lecture Notes and posted homeworks solutions. We will cover some of such detailed solutions in class.

**GRADES for the tests will depend on the form, details, and carefulness of written solutions.**

**Midterm 1** (100pts) It covers chapters 1, 2 assignments, in class material (lecture notes) and examples as posted on the course web page.

**Midterm 2** (100pts) It covers chapters 3, 4, and 5 assignments, in class material (lecture notes) and examples as posted on the course web page.

**Final** (200pts) Final will have two parts. Part ONE covers all book and lecture notes material, and problems covered by homework 1 and 2.

Part TWO covers chapters 3,4,5. assignments, in class material (lecture notes) and examples as posted on the course web page.

Part THREE: additional Discrete Mathematics Problems (covered in the second part of the course)

**All test are CLOSED NOTES and CLOSED BOOK.** If a student is found using notes or a book during a test, he/she will receive **AUTOMATICALLY 0 pts for a given test.**

**Final grade computation** During the semester you can earn 400pts or more (in the case of extra points). The grade will be determine in the following way: # of earned points divided by 4 = % grade.

The grade will be determine in the following way: % of earned points / 4 = % grade. The % grade which is translated into letter grade in a standard way i.e. 100 - 90 % is A range; A (100-96%) A- (95- 90%), 89 - 80 % is B range: B- (80 - 82%), B (83 -86%), B+ (85 -89%) , 79 - 70 % is C range: C- (70- 72%), C (73-76%), C+(76-79%), 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

**Chapter 4** Number Theory

**Chapter 5** Binomial Coefficients pp 153- 204

**Chapter 6** Special numbers pp 243- 264 (reading)

**Part Two:** Discrete Mathematics - TBA

## Homework Assignments

**HOMEWORK 1: Chapter 1** Problems on pages 17 -20. Write carefully a detailed solution to problems 2, 6, 7, 8, 9, 11, 12, 14,15, 16, 19, 18, 20, write details of pp 12-13 discussion of cyclic properties of  $J(n)$  and the false guess that  $J(n) = \frac{n}{2}$ , write details of pp 15-16 binary solutions to generalized recurrence.

**HOMEWORK 1: Chapter 2 part one** Problems on pages 62-63. Write and present a detailed solution to problems 5 ,6, 7, 8, 9, 10, 11, 13, 14, 15.

**HOMEWORK 2: Chapter 2 part two** Problems on pages 63-66. Write and present a detailed solution to problems 16, 17, 19, 20, 21, 23, 24, 25, 26, 27, 29, 30, 31.

**HOMEWORK 2: Chapter 3** Problems on pages 96- 101. Write and present a detailed solution to problems 10, 11, 12, 14, 16, 17, 19, 20, 23, 28, 31, 33, 35, 36.

**HOMEWORK 3: Chapter 4** Problems on pages 144 - 149. Write and present a detailed solution to problems 2, 6, 14, 15, 45.

**HOMEWORK 3: Chapter 5** Problems on pages 230 - 235. Write and present a detailed solution to problems 2, 4, 6, 7, 8, 15, 16, 17, 18, 35, 43, 45.

**Homework 4** will be announced

### TESTS SCHEDULE

**Practice Midterm 1** (10 extra points) Tuesday, March 6 in class

**Midterm 1** Tuesday, March 13, in class.

Midterm 1 covers problems from chapters 1,2 (all solutions posted on the course web page), plus problems in the Lecture Notes.

**Spring Break** APRIL 2- 8

**Midterm 2** Tuesday, April 24, in class.

Midterm 2 covers problems from chapters 3, 4, 5 (all solutions posted on the course web page), plus problems in the Lecture Notes.

**FINAL** Finals week May 7 -12, exact time and place t.b.a.

Final covers problems from all chapters 1- 5 covered in class. (all solutions posted on the course web page), and problems from Hmk 4.