Introduction to Discrete Mathematics. Spring 2013
AMAT 221 (2345), ICSI 221 (1762)

Overview. Discrete mathematics is a subject of increasing importance, owing to its links with other parts of pure and applied mathematics, as well as computer science. Discrete structures arise both in abstract areas such as group theory and geometry, and applied areas such as optimization, networks, and statistics. Due to the advent of computers, which are ideally suited to manipulating discrete structures, this subject has become one of the fastest growing areas of mathematics. This course is a broad introduction to discrete mathematics, with emphasis on both proofs and applications, including algorithms.

Prerequisites. There are no specific prerequisites for this course, but prior experience with abstraction and proofs is helpful. Furthermore, the successful completion of a calculus course and an elementary algebra course (linear algebra, groups) is also helpful.

Instructor Cristian Lenart, ES 116A, phone: 442-4635, email: `clenart@albany.edu`

Class meets TTh 10:15–11:35 in SS 255.

Textbook. E. Goodaire and M. Parmenter, Discrete Mathematics with Graph Theory, Third Edition, Prentice Hall, 2006, ISBN 0-13-167995-3.

Tentative syllabus. Logic. Sets, relations, and functions. Induction, recurrence relations, and generating functions. Principles of counting. Permutations and combinations. Graphs and applications: basic concepts, Eulerian cycles and the Chinese postman algorithm, shortest path algorithms and their complexity, trees and their properties, network flows and applications to matchings, graph colorings. *Note:* Not all the material in the mentioned texbook will be covered.

Homework. Homework is an essential part of this class. Homework assigned during one week will be collected at the end of the following week. Late homework is considered for half credit.

Important. You typically will have to spend twice as much time or more on learning discrete math outside of class than you spend class. In particular, it is very important to work regularly on exercises in order to test your understanding and in order to master the required techniques. Reading the book is considered part of the homework. The assigned homework represents a bare minimum amount of work needed, so I strongly advise you to work on other problems in the book. Pay particular attention to logic and proofs, which are an important part of this class. I urge those of you who have difficulties to contact me as soon as possible (not just before the tests and exam), and to come to my office hours. You are also strongly encouraged to actively participate in class and exchange ideas with the instructor and your colleagues.

Out of consideration for your fellow students' efforts to learn, and your instructor's efforts to teach, you are required to arrive on time for class and to remain seated (barring an emergency) until the class is finished. For the same reasons, please turn off cell phones, and do not send or receive text messages, play video games, read the newspaper, sing, or otherwise goof off and distract other people in the room. Loud eating or drinking, repeated talking while the instructor or other students are talking, or ringing cell-phones or pagers are not allowed during the class. Repeated violations of any of the above rules shall be grounds for sanction or dismissal from the class.

Grading. Your grade in this course is based on the final exam (30%), the two tests (35%), and the homework (35%). There will be two tests, on February 28 and April 9. The final exam is on May 15, 10:30-12:30, in SS 255, and is cumulative. The overall score will be curved based on the class performance. Attendance is required as part of your grade; you may miss 3 classes with no effect on your grade, but any absence after that will make your grade drop by a "notch" (for instance, from B to B−). Plagiarism during the tests or the final exam will result in failing the class; this includes the situation when two virtually identical papers are identified.

Office hours. My office hours are in ES 116 as follows: on Tuesday and Thursday 9:40–10:05, Tuesday 11:50–12:50, and Thursday 12:50–1:50. You need to make reasonable attempts at the homework problems before asking for any hints.