CMSC 250: Discrete Structures
Summer 2013

Basic information

Instructor: Adam Groce, agroce@cs.umd.edu
Teaching assistant: Samuel Soltoff, samuel.soltoff@gmail.com

Class schedule: Class meets 9:30-10:50 every weekday in CSIC1122. Generally MWF will be lecture, and TR will be discussion section.

Office hours: Instructor office hours will be 11:00-12:30 on Mondays and 12:30-2:00 on Fridays. TA office hours will be 12:30-2:00 on Tuesdays and 11:00-12:30 on Thursdays. Both will be held AVW 1112.

Website: The course website is http://www.cs.umd.edu/class/summer2013/cmsc250/. All homework and other handouts and information will be posted on this site.

Textbook: Discrete Mathematics with Applications, by Susanna Epp, is the recommended textbook for the class. It is not required – homework problems will be given to you in full, for example, rather than as pointers to textbook problems. However, there will be no notes handed out explaining the class material. There will be the notes you take yourself in class, and if you want another source of information the textbook is highly recommended. Because we aren’t using specific problems or assigned readings, which edition you use is not important.

Prerequisite: Minimum grade of C- in CMSC131 and minimum grade of C- in MATH141

Course overview

The goal of this course is to introduce a variety of topics in mathematics that are of particular relevance to computer science students. Along with the specific topics covered, students are expected to become more comfortable with abstract reasoning and the formality of mathematical proof. The following general areas will be touched on during the course:

- **Logic**: This is the basis of all mathematical proof, and it forms the basis of the circuits that make computers work.
- **Sets and functions**: These simple constructs are arguably the foundation of all of modern mathematics.
- **Sequences and series**: These tools are very helpful in the analysis of algorithms, which students will see in later courses.
- **Number theory**: We’ll only get to the basics, but we’ll talk about modular arithmetic, divisibility, prime factorization, and other useful topics.
- **Probability**: This is a crucial concept with a huge variety of applications. We’ll formally define some of the basic rules behind it all.
- **Combinatorics**: This is the math of counting things. We’ll study permutations and combinations and a bit of more advanced material.
• **Graph theory (if time):** This is the basis of all sorts of applications in computer science, including mathematical analysis of networks and communication.

• **Methods of proof:** This won’t be its own unit, but will rather be a continuing theme talked about during everything else being taught. In particular induction, proof by contradiction, and the pigeonhole principle will get special attention.

**Coursework and grading**

**Homework:** There will be one homework assignment per topic area. The assignment will be posted on the course website before the first class on that topic. The assignment will be due one or two days after the topic is finished being taught (usually about a week after posting). This means that the following homework will already be posted before the current one is due. Because this is a summer class, the schedule moves very quickly. You should start working on homeworks as soon as possible. If you do not, you will not have a chance to find issues you are having and ask questions in discussion or come to office hours before the homework is due.

You are allowed to work together on homework problems. However, it must be a true collaboration. A situation in which one person copies the work done without their help is not acceptable. Homework must be turned in at the beginning of class on the day it is due. Homework that is late (regardless of how late) will be given only 50% credit. The lowest-scoring homework will be ignored when calculating the class grade.

Please staple homeworks together and make sure your name is on the top of the first page. It is your job to make sure we can follow your work. If your homework is disorganized or sloppy to the extent that we have trouble grading it, we will just give you 0s on whatever parts we had trouble figuring out.

**Quizzes:** There will be quizzes given out at the beginning of many discussion sections. These will be short (5-10 minutes) and can be on any topic covered so far in class, including both very recent material and older topics. The lowest-scoring quiz will be ignored when calculating the class grade.

**Tests:** This is subject to change based on logistical limitations, but the plan currently is to have two tests during the course, each covering half of the material, on June 21st and July 12th, followed by a cumulative final on July 19th.

**Grade calculation:** The course grade will be calculated using the following weighting. (Homework and quiz portions are the average score, with each homework or quiz having equal weight.)

- Homework ....................................... 10%
- Quizzes .......................................... 15%
- Test 1 ........................................... 20%
- Test 2 ........................................... 20%
- Final ............................................ 35%
Other policies

Absence/illness: If you are absent from either of the test or final dates, you must have a note from a doctor stating that you were too sick to participate. In that case a makeup exam will be scheduled. In the case of a homework or quiz, you will be asked to sign a statement confirming your illness. (Doctor’s notes will only be requested in the event of a prolonged illness.) In the event of illness, homework will be accepted late. There will be an extra quiz administered at the end of the course to replace the missed quiz of anyone who had an excused absence during an earlier quiz.

Absences for other reasons (such as religious observances) may be approved upon request. If a reason for missing class was (or should have been) known in advance, it is expected that the student will request permission in advance of the absence. In no case will excuse be granted for a scheduled absence that was only explained after the absence.

Academic integrity: This should go without saying, but I take any violation of academic integrity very seriously. All university policies (including the honor code) will be strictly enforced. It is your responsibility not to cheat or misrepresent what you have done in any way. It is also your responsibility to inform us if you are aware of anyone else doing so.

Disability accommodations: If you need accommodations and have not already worked it out with the university, email me and I will refer you to the correct contacts.

Class cancelations: If the campus is closed for some reason, it will be listed on www.umd.edu, and we will cancel class. Weather closing information is available at 301-405-7669. If class is canceled for any other reason, it will be listed on the course website and an email will be sent to the class email list.

Advice

This is a summer course. That means that everything moves almost twice as fast as a regular course. The gap between a topic being taught and homework on that topic being due or a quiz on that topic being given is extremely small. This means that it is imperative that you work on homework early and find any difficulties you are having right away. We are happy to talk to you during office hours, re-explain things during discussion section, and generally do everything we can to fix gaps in understanding, but we can only do that if you realize that you don’t understand and let us know. Procrastination will harm you more than it will in a regular semester course.