MT 445: Combinatorics

Syllabus

Fall 2018

Professor: Josh Greene
Contact: email: joshua.greene@bc.edu
Office: Maloney 527
Office hours: M 12:15-1:45pm, Th 2:15-3:45pm, and by appointment.
Class time: MWF 11-11:50am, 8/27 -12/10. No class 9/3 (Labor Day), 10/8 (Columbus Day), and 11/21 and 11/23 (Thanksgiving).
Class location: Gasson 205
Course grader: Ruifan Yang (yangrk@bc.edu)
Course webpage: https://www2.bc.edu/joshua-e-greene/MT445F18/coursepage.html
Course description: From the course catalog:

“This course is an introduction to graph theory and combinatorics, with a strong emphasis on creative problem-solving techniques and connections with other branches of mathematics. Topics will center around the following: enumeration, Hamiltonian and Eulerian cycles, extremal graph theory, planarity, matching, colorability, Ramsey theory, hypergraphs, combinatorial geometry, and applications of linear algebra, probability, polynomials, and topology to combinatorics.”

A major theme throughout the course will be on acquiring and deploying different problem-solving strategies (pigeonhole principle, inclusion-exclusion, proof by intimidation), and sharpening some of the tools you picked up in Math 216 (induction). We will look at a number of fun problems that have a puzzle-like quality and that are motivated by the real world.

References: The required text for the course:
We will also have occasional supplements in the form of notes or copies from other sources.
Drop date: Wednesday, 9/5.
Grading format:
• Homework (30%). Problem sets will be assigned and collected on a weekly basis. Assignments will appear on the course website (not Canvas, where grades and solutions will appear), typically around the end of a given week or that weekend, and I will alert you when a new one gets posted. It will be due at the beginning of class on Friday of the following week, unless otherwise noted. No late work is accepted. You should work on the problem set using what you learned from class, the book (or other indicated sources), and from your peers. To emphasize: collaboration with your peers is permitted and encouraged! However, you must write up your homework on your own, and you are not permitted to read another
student’s write-up nor solutions from other sources. Copying from your peers, students who have taken the course in past years, or other sources will result in a score of zero and represent a breach of academic integrity (see below).

• Midterms (15% apiece). Two in-class midterms are scheduled for Friday, 10/5 and Friday, 11/9. The class before each will contain a very brief review.

• Final (30%). According to the registrar’s website: Monday, 12/17, 9:00am-12:00pm.

A missed exam, unless in case of dire emergency, will result in a score of zero. No make-up exams!

• Participation (10%). Your active participation will be vital for the development of the course! If you are typically shy during class, or if you prefer to learn all the material we will cover from books and online notes (not advised), please make an effort for me to see you engaged somehow, either by venturing occasional answers, visiting office hours, or emailing me with questions/comments. Toward this end: no cell phones, tablets, or computers are permitted in class! They are highly distracting and discouraging for myself and your peers. Please let me know if you require an exception to this rule for some reason (e.g. note-taking).

Dramatic improvement or decline over the course of the semester may alter the outcome of the final grade. For example, if you perform poorly on the first midterm but recover, improve on the second, and do excellently on the final, then the later exams will carry greater weight towards the end of raising your grade. On the other hand, if you perform reasonably on the first midterm, but decline precipitously and indicate little mastery of the material on the final exam, then your later exams will carry greater weight towards the end of lowering your grade.

Disabilities: Please inform me if you have special needs. At the request of Provost Quigley:

“If you are a student with a documented disability seeking reasonable accommodations in this course, please contact Kathy Duggan, (617) 552-8093, dugganka@bc.edu, at the Connors Family Learning Center regarding learning disabilities and ADHD, or Paulette Durret, (617) 552-3470, paulette.durrett@bc.edu, in the Disability Services Office regarding all other types of disabilities, including temporary disabilities. Advance notice and appropriate documentation are required for accommodations.”

Academic Integrity: Please visit www.bc.edu/integrity.