Math 28 – Winter 2017

My Contact Information:

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Content:

Combinatorics is the study of structures in mathematics. This course will start by developing basic set theory and counting principles, and proceed to the study of graphs, permutations, lattice walks, and more. Other topics that will be covered include proof techniques (induction, etc.), probability, and generating functions.

Textbook:

This course uses the book *Combinatorics through Guided Discovery*, by Ken Bogart. The book is available for free at the following url: http://jaypantone.com/courses/winter17math28/combinatorics-through-guided-discovery.pdf. As the name suggests, this is not a typical textbook. The bulk of the book consists of carefully constructed sequences of problems designed to help students discover the basic principles of combinatorics on their own, with only short lectures preceding each section.

Guided Discovery:

The majority of classroom time will be dedicated to group work. In small, rotating groups you will progress through assigned problems from the textbook. Collaboratively, group members will together explore much of the material to be studied in this course. Only short lectures will be given for some topics.

Class Participation:

In order for the method of Guided Discovery to work, it is essential to be present and to participate. The class participation component of your grade will come from your attendance as well as your effort within your group. Additionally, each student will be expected to present some of their group work solutions to the class.

Canvas:

Student grades will be posted on Canvas, and may be accessed through http://canvas.dartmouth.edu. All other course material will be posted on our course page. Please do not email me through the Canvas system.

X-hour:

We will use the X-hour occasionally throughout the quarter, so be sure not to schedule anything during that time (12:15pm - 1:05pm, Thursday).

Homework:

Each day in class I will assign a few homework problems. Some will be problems that we also worked on in class. On each Wednesday, the assigned questions from the previous week (Monday–Friday) will be due.

This class is often the first proof-based class that many students take. Most homework questions will ask you to prove a mathematical statement. A proof is a clear argument that justifies your result, in which each step must be justified. The best proofs are written using as much *English* as possible! Even when you use math symbols, the proof should sound like full English sentences when read out loud. For example, don't write

$$\text{``}x + 1 = 5 \implies x = 4\text{''};$$

instead, write

$$\text{``Since we know } x + 1 = 5 \text{, it follows that } x = 4.\text{''}$$

Homework Grading and Regrading:

Each homework question will be worth 10 points and will be graded on a 10/9/7/5/0 rule. A full, correct, and well-written answer will receive 10 points; an answer with a small problem or an unclear step will receive 9 points; and answer that is mostly correct but has a few problems will receive 7 points; an answer that has started along the right path and shows some effort but is incorrect (or an answer that is poorly written) will receive 5 points; other answers will receive 0 points.

Students are allowed to **resubmit** answers for any questions on which they received a grade of 0, 5, or 7, within one week from the time the graded homework is returned. You can only resubmit an answer for a problem that you attempted the first time. You cannot resubmit an answer if you never submitted an answer in the first place.

Unexcused late assignments will not be accepted.

Homework Collaboration Policy:

It can be very helpful to study and work with a group. This type of cooperative learning is encouraged; however, be sure that you have a thorough understanding of the concepts as well as the mathematical steps used to solve a problem. You must be able to work through the problems on your own. Each student must complete her or his assignment individually and independently and must turn in her or his own work.

On each homework assignment, you must **list** any resources you used to help you complete the assignment. This includes other class members with whom you discussed the problems.

Returned Papers:

You must retain all returned papers in case of any discrepancy with the recorded grades on Canvas. I cannot correct any mistakes in grading or recording of scores without the original document. All concerns regarding grades on assignments or exams must be handled within one week of the return of the paper.

Exams:

There will be two midterm exams and a final exam. The final exam will be cumulative, but with more weight on the material covered after the second midterm. The dates and locations for the exams will be posted on the course webpage and announced in class.

If you must miss an exam due to a College activity, you must seek approval from me at least two weeks prior to the exam day.

Grading Scheme:

Course scores are weighted as follows:

Homework	20%
Class Participation	15%
Midterm Exam 1	20%
Midterm Exam 2	20%
Final Exam	25%

Disabilities

Students with disabilities who will be taking this course and may need disability-related classroom accommodations are encouraged to make an appointment to see me as soon as possible. Also, they should stop by the Academic Skills Center in Collis Center to register for support services.

Religious Observances

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me before the end of the second week of the term to discuss appropriate accommodations.