Math 145: Combinatorics

1. General information

Lectures will be held Monday, Wednesday, and Friday from 12:10-1:00 in Young 184.

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Office hours: Mondays 4:30-5:30, Fridays 2:00-3:00

TA: Xiaochen Liu
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Office hours: Tuesdays 12:30-2:30

2. Textbook

The primary textbook (required) for this course is *Discrete Mathematics* (1st edition) by **Lovasz, Pelikan, and Vesztergombi**.

3. Grades

Grades will be based on homework, one quiz, one midterm, and a final exam weighted as follows:

30% Homework
10% Quiz
25% Midterm
35% Final

4. Homework

Homework assignments will typically be **due on Wednesdays at 5pm** through *Gradescope*.

Assignments will be posted on the course website, typically one week in advance of the due date.

Homework must be turned in *on time* in order to be graded.

Your lowest homework score will be dropped.

Students are encouraged to discuss the problems from the homework assignment together, but must write up solutions independently. If two students turn in solutions with identical or nearly identically written solutions, both solutions will receive zero credit.

5. Exams

There will be one quiz, one midterm, and one final exam.

Quiz: Friday, April 12, 12:10-1:00pm
Midterm Exam: Friday, May 3, 12:10-1:00pm
Final Exam: Friday, June 7, 8:00-10:00am

There will be no make-up exams. If you require special accommodation in taking the exams, please let me know well in advance of each exam.
No calculators or other electronic devices will be permitted in the exams.

6. Academic Honesty

Cheating and other instances of academic misconduct will be taken very seriously. All students at UC Davis are expected to follow the Code of Academic Conduct. See https://participate.ucdavis.edu/ for further information on participating in keeping UC Davis a fair and honest community and see http://sja.ucdavis.edu/files/cac.pdf for the Code of Academic Conduct. If academic misconduct is admitted or is determined by adjudication to have occurred, the instructor may assign the student a grade of F in the course per Regulation 550.

7. Accommodations

Any student with a documented disability (e.g. physical,learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Student Disability Center (SDC). Faculty are authorized to provide only the accommodations requested by the SDC. If you have any questions, please contact the SDC at 530/752-3184 or sdc@ucdavis.edu.

8. Schedule of topics

The following is a guideline for the topics we will cover in the course and the order in which they will be covered. This schedule and the pacing may be modified during the quarter based on the needs of the class. The numbers in parentheses indicate the relevant section of the textbook.

Week 1: Counting problems, sets and subsets, induction (1.1, 1.2, 1.3, 1.5, 1.6, 1.7, 1.8, 2.1)

Week 2: Inclusion-exclusion, Pigeon-hole principle (2.3, 2.4)

Quiz, Friday April 12

Week 3: Birthday paradox (2.5), Binomial theorem, permutations (3.1, 3.2, 3.3, 3.4)

Week 4: Pascal's triangle (3.5, 3.6) Fibonacci numbers (4.1, 4.2)

Week 5: Fibonacci identities (4.2, 4.3), Midterm review

Midterm, Friday May 3

Week 6: Graphs, paths, cycles, Eulerian walks and Hamiltonian cycles (7.1, 7.2, 7.3)

Week 7: Trees (8.1, 8.2, 8.3)

Week 8: Optimization (9.1, 9.2) and Matchings (10.1, 10.2, 10.3, 10.4)

Memorial Day, Monday May 27

Week 9: Euler's formula and planar graphs (12.1, 12.2, 12.3)

Week 10: Final exam review

Final exam Friday, June 7, 8:00 am