

# MATH 55—Discrete Mathematics

Professor Kenneth A. Ribet

TuTh 12:30–2:00pm, 2050 VLSB

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## 1. INSTRUCTOR AND GENERAL INFORMATION

- Instructor: Professor Ken Ribet
- Email: [ribet@berkeley.edu](mailto:ribet@berkeley.edu)
- Office: 885 [Evans Hall](#)
- Office telephone: (510) 642-0648 (no voicemail, sorry)
- Office hours:
  - Tuesday, 2:30–4PM, Student Learning Center
  - Thursday, 10–11:30AM, 885 [Evans Hall](#)
- Course web pages:
  - [Ribet-maintained Math 55 page](#)
  - [Campus-maintained bCourses Math 55 page](#)
  - [Our class's piazza page](#)
  - [The math department page for this course](#)

## 2. TEXTBOOK

Required text: [Discrete mathematics](#) by Ken Rosen

There should be a (well-priced) special “Berkeley edition” of this book at campus bookstores. As I tried to explain on piazza, you may be able to limp along with the seventh edition of the book if you have punctual access to the eighth edition to look up the assigned homework problems.

## 3. ENROLLMENT AND SECTION SWITCHING

The math department maintains a [web page](#) with relevant enrollment information. Note in particular the email address [enrollment@math.berkeley.edu](mailto:enrollment@math.berkeley.edu) for enrollment requests. The course instructor and the class GSIs have no special enrollment powers.

## 4. LECTURES

**No devices!** In general, laptops, phones, or other electronic equipment must be put away during lectures and discussion sections. Students with special needs who can benefit from electronic note-taking may use their devices in class after consultation with the instructor (for lectures) or the GSI (for discussion sections). Students using devices are asked to sit at the front of the room whenever possible. The themes and section numbers for each lecture are listed on the [class web page](#). To get the most out of each lecture, it is best to *read the relevant sections of the textbook before the lecture*.

If miss a lecture, ask your classmates for notes from the session that you missed.

During lectures, I will use the chalkboards, some slides that were prepared ahead of time, and the document camera. After each lecture, I will post the slides that were projected as well as scans of the pages that were projected from the document camera. A peer evaluation from my Math 10 class last year had this to say about my use of slides:

... never reads/repeats slide text, but truly complements and expands on it. There is a unique value in coming to Ribet's class, to get his explanation that cannot be found anywhere else.

As I lecture, I pause often to invite questions: "What are your questions." You can stop me *any time* during a lecture—there's no need to wait for my invitation. I tend to speak fast; asking questions gives your classmates a moment to catch their breath and often clarifies issues that were on other people's minds. Don't be shy about speaking up in class!

## 5. DISCUSSION SECTIONS

5.1. **Enrollment:** Each student must sign up for a specific discussion section in order to be enrolled in Math 55.

5.2. **Attendance:** Discussion sections and lectures are mandatory.

## 6. OFFICE HOURS

Come to office hours! I very much want to meet everyone in the course. My office is fairly small, but we may be able to move to a seminar room if a crowd gathers. For Tuesday office hours, the SLC is effectively infinite.

## 7. PIAZZA

Questions of any kind about the course or a homework problem can be posted on piazza. "Dumb questions" are highly encouraged! Odds are that you'll get a useful answer very quickly from the instructor, a GSI or another student. The advantage of piazza is that everyone gets to see the answers to the questions. Please try to refrain from posting anonymously: Math 55 is a community, and it'll be good for us to get to know one another.

## 8. HOMEWORK

Homework will be due on Wednesdays. Assignments will be posted on the [class web page](#). There will be fourteen assignments, each worth  $X$  points (probably  $X = 10$ ). Your total homework score will be the sum of your 12 highest scores, plus one-half of your next-to-lowest score. Your lowest score will be dropped.

## 9. QUIZZES

There will be roughly 10 quizzes during the semester. Quizzes are given in section. The dates of the quizzes will be announced well in advance. (I will consult with the GSIs at the beginning of the semester.)

## 10. EXAMINATIONS

- First midterm exam, Thursday, February 21, 2019, in class
- Last midterm exam, Thursday, April 4, 2019, in class
- Final examination, Thursday, May 16, 2019, 3–6PM

Please do not plan travel on the dates of these exams. If you believe that you have a conflicting obligation because of an intercollegiate sport or other extracurricular activity, please read [these guidelines](#) immediately.

Remarks concerning the exams:

- I consider it to be a great importance that exam solutions be written up in *complete English sentences*. “Solutions” that include shortcut symbols or consist of strings of equations are likely to receive little or no credit. We cannot guess what was in your mind when you wrote your solutions. *Your exam paper represents you to the grader; you are not present to explain what you intended.*
- There will be no make-up exams. Exams will be given only on the dates and at the times that are listed.
- If you have a conflict with one of the exams, you might consider taking the course over the summer or next year.
- The exam questions will be drawn from topics in the lectures, questions treated in the textbook, homework problems, and quiz problems.
- I have taught the course several times before! You will find my exams from spring, 2013, spring, 2015 and earlier semesters on the [class web page](#).
- The first midterm covers the first third of the course. The second midterm focuses on the second third of the course but might incidentally call on material that was discussed at the beginning of the semester. The final exam is comprehensive. (It covers the whole course.)
- If you get a low grade (0, for example) on one of the two midterms, all is not lost! See below for a discussion of the algorithm that will be used to compute final grades.
- However, missing a midterm without a very good reason is most definitely *not* recommended!

## 11. GRADING

Course grades will be based on a numerical score that is intended to weight the course components roughly as follows: midterm exams 17% each, homework and quizzes 20%, final exam 46%. Incomplete grades will be assigned only to students for whom a documented medical, personal or family emergency precludes completion of the course. Students receiving such grades are required to have been doing work of passing quality up to the moment of the emergency.

Here’s a description of the computations that we’ll do after the final exam has been graded. After appropriate multipliers have been applied to scores, each student will have:

- a first midterm grade  $M_1$  between 0 and 17,
- a second midterm grade  $M_2$  between 0 and 17,
- a final exam grade  $F$  between 0 and 46,
- a GSI-generated grade  $G$  between 0 and 20 that pertains to quizzes and homework.

The sum of these four grades is the *composite score*

$$C = M_1 + M_2 + F + G.$$

Thus

$$0 \leq C \leq 100,$$

and a “perfect” student will have a composite score of 100.

Most of us are not perfect. Also, many students walk out of a midterm exam with the sense that they did not perform at their best. Accordingly, we will compute the two variant

scores

$$C' = \frac{80}{63}(M_2 + F) + G, \quad C'' = \frac{80}{63}(M_1 + F) + G.$$

If you fell asleep during the first midterm but had perfect scores on the other components of the class, then your  $C'$  will be 100. Similarly for the second midterm and  $C''$ .

Each student's numerical course grade will be the *maximum* of  $C$ ,  $C'$  and  $C''$ . Your final letter grade will be derived entirely from  $\max\{C, C', C''\}$ —high numbers get better letter grades. The letter grade distribution for this course has historically been: 31%  $A$ , 34%  $B$ , 24%  $C$ , 11%  $D/F$ . I will aim for a similar distribution of grades in this course; the numerical course grades will be curved.

However, experience suggests that the  $D$ s and  $F$ s in Math 55 go to students who “gave up” on the course toward the end of the semester, quite often because of a single low midterm exam grade. To the extent that the “ $\max\{\dots\}$ ” scheme reduces the number of students who jump ship, the number of  $D$ s and  $F$ s will be reduced and there will be correspondingly more  $A$ s,  $B$ s and  $C$ s.

## 12. DSP

If you expect that a disability specialist will issue a letter mandating special accommodations for you, please tell me and your GSI about the accommodations that you expect to be granted as soon as you are aware that a letter will be forthcoming. The earlier we are informed about your DSP status, the easier it will be for us to arrange appropriate accommodations for you.

## 13. ACADEMIC INTEGRITY

The Mathematics Department, and in particular, the instructor and the GSIs in this course, expect that students in mathematics courses will not engage in cheating or plagiarism. The following text is taken from the Mathematics Department web site:

**13.1. What does cheating mean?** Broadly speaking, cheating means violating the policies of a course or of the university in order to gain an unfair advantage over fellow students. A particular kind of cheating is plagiarism, which means taking credit for someone else's work. Cheating and plagiarism hurt your fellow students in the short term, they hurt the cheater in the long term, and they will not be tolerated. On exams, the most basic type of cheating is copying off of someone else's paper. Graders easily spot when two exam papers look unusually similar, or have similar (wrong or correct) answers, calculations, ideas, or thought structure, even if written in different words or order of words. Even glancing at someone else's paper to check your answer is cheating. If you write the correct answer to a computational problem without any justification or with a bogus justification leading to that answer, this raises strong suspicions that you cheated, on top of not receiving any credit anyways due to the lack of correct justification.

**13.2. Electronic devices on exams/quizzes.** Electronic devices such as phones, ipads, calculators (electronic, mechanical, or any other type), and other devices, are also not allowed on exams/quizzes (unless explicitly allowed by the instructor), not even to tell the time. There are too many ways to cheat using software and the Internet. Exams are not intended to test your ability to find the answer by any means necessary. The questions might be too easy for that! Rather, exams/quizzes are supposed to test your understanding of the course

material, which you will need in order to use math correctly in subsequent courses and in the real world.

**13.3. Expectations on exams, quizzes, and HW.** Exams and quiz papers are expected to be your own work. In this class we encourage collaboration on homework, but it is your job to learn to do HW problems independently so as to be able to solve similar problems on exams and quizzes. When allowed, if you use proofs or calculations from textbooks or class notes, you need to cite these sources, even if you have rewritten the material in your own words; otherwise it is plagiarism.

**13.4. How to avoid cheating?** It is your responsibility to take reasonable precautions to prevent cheating. In exams, you should sit as far away from other students as the room permits, and hold your exam papers in such a way that they are not easily visible to other students.

**13.5. What to do in a case of cheating?** If you suspect that other students are cheating, you should immediately inform the instructor and/or your GSIs. Students may be cheating in ways that the instructor/GSI has never even heard of (unlikely, but possible). Even if you don't mention any names, the sooner you inform the instructor/GSI what is going on, the sooner they can take measures to put a stop to it. You can further report a cheating at: <http://sa.berkeley.edu/conduct/reporting/academic>.

**13.6. Resolution to cheating.** If you are suspected of cheating, the instructor may pursue a variety of actions depending on the particular nature of the incident. If you accept responsibility for academic misconduct, the matter can often be resolved between you and the instructor with possible academic sanctions ranging from losing points on an exam/quiz to failing the class, and a report will be sent to the Mathematics Department and/or Center for Student Conduct. It is not necessary for the instructor to determine whether the student(s) has a passing knowledge of the relevant factual material. It is understood that any student who knowingly aids in cheating is as guilty as the cheating student.

In serious incidents, or if you maintain that you are not responsible for academic misconduct, the instructor has the freedom and responsibility to impose any academic sanctions within the course that she deems appropriate, and the case will very likely be forwarded to the Center for Student Conduct. In such a case, more stringent actions (e.g., dismissing the student from the university) can be initiated by the Office of Student Conduct.

**13.7. Conclusion.** We hope that the above clarifications will help prevent cheating. If you have any questions about the rules or expectations, you should not hesitate to ask the instructor/GSI, or the vice chair for undergraduate affairs in the Mathematics Department.

## 14. DISRUPTED EXAMINATIONS

The following has been adapted from the Mathematics Department advising materials to faculty.

**14.1. State law during fire alarms.** Over the years, several final examinations have been disrupted by false fire alarms. State law requires that buildings must be evacuated during alarms, and the police department suggests that classes do so in an orderly, efficient fashion so that students can return to work as quickly as possible.

14.2. **Penalties for false alarms.** A false alarm is a misdemeanor, with a penalty of up to \$1,000 in fines and up to one year in jail. If the alarm results in bodily injury (e.g., someone has a heart attack), a false alarm can be a felony with a penalty up to \$5,000 in fines and three years in state prison.

14.3. **When an alarm does sound during an exam.**

- If an alarm is pulled after the exam has been going on for more than 2/3 of the overall allotted time, the exam will be considered complete and the grading scale will be adjusted accordingly at the discretion of the instructor.
- If an alarm has been pulled after the exam has been going on for less than 15 minutes, we will evacuate and the students will leave the exams on their desks. After the alarm has been cleared, the students will proceed back to the classroom and resume the exam. Anyone found carrying his/her exam outside the classroom will not be allowed to continue the exam, and the instructor will be given the freedom to decide how and whether to grade this student's exam.
- During an evacuation, the instructor and the GSIs will visibly monitor the students to cut down on casual exchanges of exam information.
- For exams that have been going on between 15 minutes and less than 2/3 of the total allotted time, the students will leave their papers in the classroom and evacuate. It will be up to the instructor to decide if there is enough time to resume the exam or to reschedule it.