

Introduction to combinatorics (Math 142), Fall 2022
MacQuarrie 233, MW noon–1:15pm (Sec. 03, code 59391)

Instructor: Dr. Tim Hsu (pronounced “shoe”).

Office and phone: MacQuarrie Hall 316, (408)924-5071.

Office hours: Tue and Wed 1:30–2:30pm (by Zoom).

E-mail: tim.hsu@sjsu.edu. I can be reached by e-mail at many times of the day, and will try to respond within 24 hours.

Course web page: <http://www.math.sjsu.edu/~hsu/courses/142/>

Text: *Applied Combinatorics* (6th edition), by Alan Tucker. Make sure you get the **6th** edition.

Semester grade: Homework 20%; Exam 1 14%; Exams 2 and 3 18% each; final exam 30%.

What this course is about. In combinatorics, we study finite objects, like graphs, or the set of all possible poker hands, and we answer questions like:

- *Do there exist objects of a certain type?* For example, is there a graph that you can’t draw on a piece of paper without its edges overlapping?
- *If so, how many such objects are there?* For example, how many ways are there to get a “full house” in poker?

Practical skills you will learn. Among the marketable skills you will learn from this course are:

- Combinatorial reasoning (thinking about problems in terms of sets and functions);
- Solving problems without knowing how to solve them beforehand;
- Justifying your problem-solving in written and verbal form; and
- Working in a team.

That’s why we work in teams on problem-solving in class, and that’s why you should expect to put a lot of time and effort into the weekly homework (see below).

Homework. Homework will be due roughly once a week, with a first draft of problem set 01 due **Wed Aug 24**, and the final version due **Mon Aug 29**. For more details on homework content and the process of doing homework (including revisions), see the handout on homework.

Specific homework assignments will be determined as the term progresses. For a complete list of all homework assigned to date, and downloadable versions of almost all handouts from class, you can always check the course web page.

Exams. We will discuss this topic in more detail before the first exam, but briefly, the material on exams will mostly resemble the material from the homework. All exams are closed-book.

Calculators. You will *not* be allowed to use calculators for *any* in-class exams. The numerical work on exams will be simple enough that a calculator shouldn’t be necessary, and even if you make numerical mistakes, you won’t lose a lot of points on them.

Exam dates. The dates of our three in-class exams and final exam are found on the syllabus below. In particular, the final exam will be held on **Wed Dec 14**, from **9:45am–noon**. Please make sure that you are still on campus at that time (e.g., don’t buy a plane ticket that leaves town on Dec 13).

How to add this course. If you are not registered for this course, and you would like to add it, you must first put a full effort into completing all of the work in the course. Second, if you are a graduating senior, you need to produce documentation to verify that.

I'll make a waiting list, which you get on by filling out and turning in the information form for the course. I'll give out add codes starting one week before **Thu Sep 15**, mainly based on completeness of homework, and as long as there is room, I will continue to give out add codes until add/drop date (**Thu Sep 15**). Note, however, that graduating seniors have the highest priority, and that Open University students have the lowest priority.

How to drop this course. Until **Thu Sep 15**, you can drop at my.sjsu.edu. Nothing will appear on your transcript, but please let me know if you drop.

To drop after Thu Sep 15, you must go to the student services center and submit a Course Drop form to the Director of Academic Services. Dropping under these circumstances is only allowed for "serious and compelling reasons" (course catalog). A low grade is not a serious and compelling reason.

Academic integrity. Your commitment to learning (as shown by your enrollment at SJSU) and SJSU's Academic Integrity Policy require you to be honest in all of your academic course work. Faculty are required to report all infractions to the Office of Student Conduct and Ethical Development. See: www.sjsu.edu/studentconduct

Disabilities. If you need course adaptations or accommodations due to a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities register with the Accessible Education Center (formerly the Disability Resources Center) to establish a record of their disability.

COVID/Monkeypox Safety: Students registered for a College of Science (CoS) class with an in-person component should view the CoS COVID-19 and Monkeypox Training slides for updated CoS, SJSU, county, state and federal information and guidelines, and more information can be found on the SJSU Health Advisories website. By working together to follow these safety practices, we can keep our college safer. Failure to follow safety practice(s) outlined in training, the SJSU Health Advisories website, or instructions from instructors, TAs or CoS Safety Staff may result in dismissal from CoS buildings, facilities or field sites. Updates will be implemented as changes occur (and posted to the same links).

| Date | Reading | Date | Reading |
|------------|------------------|-------------------|---------------------------|
| | | Mon Oct 17 | Review |
| | | Wed Oct 19 | Exam 2 |
| Mon Aug 22 | Intro, 1.1 | Mon Oct 24 | 6.2 |
| Wed Aug 24 | 1.2–1.3 | Wed Oct 26 | 6.2–6.3 |
| Mon Aug 29 | 1.3–1.4 | Mon Oct 31 | 6.3, 7.1 |
| Wed Aug 31 | 1.4, 2.1 | Wed Nov 02 | 7.1 |
| Mon Sep 05 | Labor Day | Mon Nov 07 | 7.2 |
| Wed Sep 07 | 2.2 | Wed Nov 09 | 7.3 |
| Mon Sep 12 | 2.3 | Mon Nov 14 | 7.4 |
| Wed Sep 14 | 2.2–2.3, Recap | Wed Nov 16 | 7.5 |
| Mon Sep 19 | Exam 1 | Mon Nov 21 | Exam 3 |
| Wed Sep 21 | 5.1 | Wed Nov 23 | Thanksgiving Break |
| Mon Sep 26 | 5.2 | Mon Nov 28 | 8.1 |
| Wed Sep 28 | 5.3 | Wed Nov 30 | 8.2 |
| Mon Oct 03 | 5.4 | Mon Dec 05 | Review |
| Wed Oct 05 | 5.5 | | |
| Mon Oct 10 | 5.5, 6.1 | Wed Dec 14 | FINAL EXAM |
| Wed Oct 12 | 6.1 | | 9:45am–noon |