Course Syllabus

For basic course information, see the Course Policies page, Area 1.

The Course learning goals are listed at the bottom of our front page.

<u>COVID Statement</u>: Our class sessions may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded.

If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared.

As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Schedule

Lecture number	Date	Topics
1	Monday 8/31	The Pigeon-Hole Principle Sections 1.1 and 1.2.
2	Wednesday 9/2	Mathematical Induction Sections 2.1 and 2.2.
3	Friday 9/4	Permutations with or without repetitions. Section 3.1.
	Monday 9/7	Labor day (no class)
4	Wednesday 9/9	Strings over a finite alphabet.
		Section 3.2.

5 Friday 9/11 Quiz 1

6	Monday 9/14	Choice problems. Section 3.3.
7	Wednesday 9/16	The Binomial Theorem and Combinatorial Identities. Section 4.1.
8	Friday 9/18	The Multinomial Theorem. Real Exponents. Sections 4.2 and 4.3.
9	Monday 9/21	Compositions of Integers. Section 5.1.
10	Wednesday 9/23	Set Partitions. Section 5.2. Test review. Practice problems.
11	Friday 9/25	Quiz 2
12	Monday 9/28	Integer Partitions. Section 5.3.
13	Wednesday 9/30	Cycles in Permutations. Section 6.1.
13a	Friday 10/2	There will be a class! Subject to be announced.
14	Monday 10/5	Permutations with Restricted Cycle Structure. Section 6.2.
15	Wednesday 10/7	The Principle of Inclusion and Exclusion. Section 7.1.
16	Friday 10/9	Quiz 3.
17	Monday 10/12	Applications of the Principle of Inclusion and Exclusion. Section 7.2.

18	Friday 10/16	Ordinary generating functions. Solving recurrence relations. Section 8.1.1
19	Monday 10/19	The product formula for ordinary generating functions. Section 8.1.2.
20	Wednesday 10/21	Test review. Practice problems with ordinary generating functions. The compositional formula for ordinary generating functions. Section 8.1.3
21	Friday 10/23	Quiz 4
22	Monday 10/26	The compositional formula for ordinary generating functions. Section 8.1.3.
23	Wednesday 10/28	Exponential generating functions and recurrence relations. Section 8.2.1.
24	Friday 10/30	Product formula for exponential generating functions. Section 8.2.2
25	Monday 11/2	The exponential formula and the compositional formula for exponential generating functions. Section 8.2.3.
26	Wednesday 11/4	Test review. Practice problems with exponential generating functions.
27	Friday 11/6	Quiz 5
28	Monday 11/9	The notion of graphs. Section 9.1.
29	Wednesday 11/11	Veterans day (no class)
30	Friday 11/13	Eulerian cycles. Section 9.2.

31	Monday 11/16	Hamiltonian cycles. Section 9.3.
32	Wednesday 11/18	Directed graphs. Section 9.4.
33	Friday 11/20	Quiz 6.
34	Monday 11/23	The notion of trees. Section 10.1.
	Wednesday 11/25	Thanksgiving break (no class)
	Friday 11/27	Thanksgiving break (no class)
35	Monday 11/30	Finding the minimum cost spanning tree. Section 10.2.
36	Wednesday 12/2	Graphs and matrices. Section 10.3.
37	Friday 12/4	The number of spanning trees of a graph. Section 10.4.
38	Monday 12/7	Final exam review.
39	Wednesday 12/9	Final exam review.

Please see the <u>Course Policies page</u> for detailed information on grading.

The textbook is A Walk Through Combinatorics, 4th edition. (Older editions do not have the Quick Check exercises at the end of each section, which will be important.) You can buy it <u>on amazon.com through this link.</u>

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the <u>Disability Resource Center</u>. It is

important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

See Area 4 of the <u>Course policies page</u> for information about student evaluations of this course.