

Math 579: Combinatorics (Spring 2023)
Lecture Schedule

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Below is a list of the topics we intend to cover, along with a rough schedule. Actual schedule is subject to change without notice. Last updated March 15, 2023.

Week	Topic	Chapters
1/18 – 1/20	Overview of Syllabus	
	Introduction to Combinatorics	
	Review Mathematical Induction	2.1–2.2
1/23 – 1/27	Elementary Counting Methods	3.1–3.3
	Permutations and Binomial Coefficients	
1/30 – 2/3	The Pigeon-Hole Principle	1.1–1.2
	Inclusion-Exclusion and the Sieve Formula	7.1
2/6 – 2/10	Combinatorial Proofs	4.2
2/13 – 2/17	The Binomial Theorem	4.1
*2/20 – 2/24	Compositions	5.1
	Integer Partitions	5.3
2/27 – 3/3	Set Partitions	5.2
3/6 – 3/10	Catalan Numbers	
3/13 – 3/17	Exam Review	
	Midterm Exam: Thursday, March 16	
3/20 – 3/24	Mapping Catalan-Land	
	Guest Lecture: Gordon Kirby	
3/27 – 3/31	<i>Spring Break: No Classes</i>	
*4/3 – 4/7	Directed and Undirected Graphs	9.1–9.3
	Graph Isomorphisms	9.4
4/10 – 4/14	Trees	10.1
	Adjacency and Incidence Matrices	10.3
	Counting Spanning Trees	10.4
4/17 – 4/21	Bipartite Graphs	11.1–11.2
	Coloring and Matching	11.3–11.4
*4/24 – 4/28	Planar Graphs	12.1
	Dual Graphs	12.2
*5/1 – 5/4	The Sensitivity Conjecture	
	Review for Final Exam	