

Math 579: Combinatorics (Spring 2024)
Lecture Schedule

Instructor: Christopher O'Neill

E-mail: cdoneill@sdsu.edu

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 January 22, 2024.

| Week | Topic | Chapters |
|--------------|---|-----------|
| 1/17 – 1/19 | Overview of Syllabus | |
| | Introduction to Combinatorics | |
| | Review Mathematical Induction | 2.1–2.2 |
| 1/22 – 1/26 | Elementary Counting Methods | 3.1–3.3 |
| | Permutations and Binomial Coefficients | |
| 1/29 – 2/2 | The Pigeon-Hole Principle | 1.1–1.2 |
| | Inclusion-Exclusion and the Sieve Formula | 7.1 |
| 2/5 – 2/9 | Combinatorial Proofs | 4.2 |
| 2/12 – 2/16 | The Binomial Theorem | 4.1 |
| *2/19 – 2/23 | Compositions | 5.1 |
| | Integer Partitions | 5.3 |
| 2/26 – 3/1 | Set Partitions | 5.2 |
| 3/4 – 3/8 | Catalan Numbers | |
| 3/11 – 3/15 | Mapping Catalan-Land | |
| 3/18 – 3/22 | Exam Review | |
| | Midterm Exam: Thursday, March 21 | |
| *3/25 – 3/29 | Directed and Undirected Graphs | 9.1–9.3 |
| | Graph Isomorphisms | 9.4 |
| 4/1 – 4/5 | <i>Spring Break: No Classes</i> | |
| 4/8 – 4/12 | Trees | 10.1 |
| | Adjacency and Incidence Matrices | 10.3 |
| | Counting Spanning Trees | 10.4 |
| 4/15 – 4/19 | Bipartite Graphs | 11.1–11.2 |
| | Coloring and Matching | 11.3–11.4 |
| *4/22 – 4/26 | Planar Graphs | 12.1 |
| | Dual Graphs | 12.2 |
| *4/29 – 5/2 | The Sensitivity Conjecture | |
| | Review for Final Exam | |