**Math 175 Suggested Syllabus**

**Text:** *Introductory Combinatorics, 5th edition,* by Richard A. Brualdi

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| **Section** | **Topic** |
| 1.1-1.4 | What is Combinatorics? |
| 2.1 | Four Basic Counting Principles |
| 2.2 | Permutations of Sets |
| 2.3 | Combinations of Sets |
| 2.4 | Permutations of Multisets |
| 2.5 | Combinations of Multisets |
| 2.6 | Finite Probability |
| 3.1, 3.2 | Pigeonhole Principle |
| 3.3 | A Theorem of Ramsey |
| 5.1 | Pascal’s Triangle |
| 5.2 | The Binomial Theorem |
| 5.3 | Unimodality of Binomial Coefficients |
| 5.4 | The Multinomial Theorem |
| 5.5 | Newton’s Binomial Theorem |
| ----- | **Midterm Exam** |
| 6.1 | Inclusion-Exclusion Principle |
| 6.2 | Combinations with Repetition |
| 6.3 | Dearrangements |
| 7.1 | Some Number Sequences |
| 7.2 | Generating Functions |
| 7.3 | Exponential Generating Functions |
| 7.4 | Solving Linear Homogeneous Recurrence Relations |
| 7.5 | Nonhomogeneous Recurrence Relations |
| 8.1 | Catalan Numbers |
| 8.2 | Difference Sequences and Stirling Numbers |
| 8.3 | Partition Numbers |
| ----- | Review |
| ----- | **Final Exam** |