

MACM 201 Syllabus

- Topic #1 – Advanced Probability
 - Review of Finite Probability
 - Conditional Probability
- • Topic #2 - Inclusion-Exclusion
 - The Principle of Inclusion-Exclusion (review)
 - Generalized Inclusion-Exclusion
 - Derangements
- • Topic #3 – Advanced Enumeration
 - Introduction to Generating Functions
 - Calculational Techniques
 - Partitions of Integers
- • Topic #4 - Recurrence Relations
 - First-Order Linear Recurrence Relations
 - Second-Order Linear Homogeneous Recurrence Relations with Constant Coefficients
 - Nonhomogeneous Recurrence Relations
 - The Method of Generating Functions
 - Divide-and-Conquer Algorithms (optional)
- • Topic #5 - Graph Theory
 - Definitions
 - Subgraphs, Complements, and Graph Isomorphism
 - Vertex Degree: Euler Trails and Circuits
 - Planar Graphs
 - Hamilton Paths and Cycles
 - Graph Coloring and Chromatic Number (optional)
- • Topic #6 - Optimization and Matching
 - Review of Trees
 - Dijkstra's Shortest-Path Algorithm
 - Minimum Spanning Trees: Kruskal's and Prim's Algorithms
 - Matching Theory (optional)