MATH 3400 / LGIC 2100 Discrete Mathematics I Professor Andre Scedrov

Prerequisites: Math 1140 (previously Math 114) or permission of the instructor.

Textbook: Alan Tucker, "Applied Combinatorics", Wiley, Sixth Edition, 2012. Ebook: SKU:9781118324516R150 - 6TH 12 MBS 2760232

Topics Covered

Textbook Chapters 1-2, some of Chapter 3, Chapter 5, Chapters 7-8, Chapter 10, and some selected topics:

Chapter 1. Elements of Graph Theory: Graph Models, Isomorphism, Edge Counting, Planar Graphs.

Appendix A.2. Mathematical Induction.

Chapter 2. Covering Circuits and Graph Coloring: Euler Cycles, Hamilton Circuits, Graph Coloring, Coloring Theorems.

Chapter 3. Trees: Properties of Trees.

Chapter 5. General Counting Methods for Arrangements and Selections: Two Basic Counting Principles, Simple Arrangements and Selections, Arrangements and Selections with Repetitions, Distributions, Binomial Identities.

Chapter 7. Recurrence Relations: Recurrence Relations Models, Divide-and-Counter Relations, Solution of Linear Recurrence Relations, Solution of Inhomogeneous Recurrence Relations.

Appendix A.1. Basic Set Theory.

Chapter 8. Inclusion-Exclusion: Counting with Venn Diagrams, Inclusion-Exclusion Formula.

Chapter 10. Games with Graphs: Progressively Finite Games, Nim-Type Games.

Basic Course Information

There will be two take-home midterms, due on Canvas online in pdf Tuesday, October 1, 2024 and Thursday, November 21, 2024, respectively, and each worth 25% of the grade. Each midterm assignment will have at least ten days lead time, during which there will be no homework.

The final exam will also be take-home, due on Canvas online in pdf on Monday, December 16 and will be worth 30% of the grade. The final exam will be cumulative and will be assigned with at least ten days lead time, during which there will be no homework.

Most other weeks during the semester there will be homework, to be completed at home and turned in to Canvas online in pdf. Total homework will be worth 20% of the grade. One lowest score homework can be dropped.