

MA 367 Combinatorial Enumeration

Syllabus*

Course Description An introduction to the mathematical theory of counting. Basic counting principles, permutations and combinations, partitions, recurrence relations, and a selection of more advanced topics such as generating functions, combinatorial designs, Ramsey theory, or group actions and Pólya theory.

Prerequisites MA 126 or consent of instructor. MA 320 is *strongly* recommended.

Textbook *Applied Combinatorics*, (Fifth edition) by Alan Tucker. Published by Wiley (2007). ISBN: 978-0-471-73507-6.

Topics

The topics covered in this course may include basic graph theory, circuits, graph colouring, trees, permutations, combinations, generating functions, recurrence relations, and the inclusion-exclusion principle

Learning Objectives

- Understand basic graphs and be able to apply graph theory to solve some to real-world problems.
- Understand a range of graph theoretic results involving Euler cycles, Hamiltonian circuits, graph colouring, trees and searching.
- Be able to solve a wide variety of problems involving ordered and unordered selections.
- Understand the importance of generating functions in combinatorics and be able to use generating functions to solve a variety of combinatorial problems.
- Be able to model and solve a range of combinatorial problems using recurrence relations.
- Understand the Inclusion-Exclusion Principle and be able to use it to solve some combinatorial problems.

*Last updated September 21, 2010