

DEPARTMENT OF MATHEMATICS

SYLLABUS

Course # & Name: MAT 146: Algebraic Combinatorics

Recommended Text(s) & Price: Herbert Wilf, "Generatingfunctionology", ISBN: 1-56881-279-5, 2005, \$39 or available for free at <http://www.math.upenn.edu/%7Ewilf/DownldGF.html>

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Lecture(s)	Sections	Comments/Topics
2	Chapter 1	Recurrences, generating functions
3	Chapter 1	Examples: Fibonacci numbers, binomial coefficients, Stirling numbers of second kind
1	Chapter 1	Bell numbers, exponential generating functions
6	Chapter 2	Formal power series, calculus of formal power series. Examples: Fibonacci numbers (again), Catalan numbers, derangements, Moebius function
3	Chapter 3	Exponential formula: Cards, decks, hands
5	Chapter 3	Examples: Permutations and their cycles, involutions, 2-regular graphs, connected bipartite graphs, labeled trees, money changing problem, partitions of integers, rooted trees and forests
3	Chapter 4	Sieve method, fixed points in permutations, k-cycles, Stirling numbers (again), rooks on chessboard, snake oil method
5	Chapter 4; Biggs Chapter 27	Cycle index of symmetric group, cyclic, dihedral symmetry symmetries in 3 dimensions, Polya theory