

# CO 330 Combinatorial Enumeration

Fall 2011

## Topics.

The technique of bijective proofs. Binomial identities and lattice paths. The  $q$ -Binomial Theorem. Recursive structure: binary rooted trees, plane planted trees, super-diagonal lattice paths; Catalan numbers. The algebras of polynomials, formal power series, formal Laurent series, and rational functions over an integral domain. The Lagrange Implicit Function Theorem. Integer partitions: elementary identities, Euler's Pentagonal Number Theorem, Jacobi's Triple Product Formula, Ramanujan's First Partition Congruence. Introduction to exponential generating functions.

## Coursework and grading.

- 15% Homework – six assignments, biweekly.
- 30% Midterm Examination.
- 55% Final Examination.

## Textbook.

Course notes for CO 330 are available at Pixel Planet (MC 2018).

## Website.

<http://www.math.uwaterloo.ca/~dgwagner/co330.html>

Homework assignments and solutions, midterm exam solutions, and supplementary reading material will be posted here as the semester progresses.

## Office hours, teaching assistants, etc.

These are yet to be determined.