

Course Announcement

Fall 2011

MTH 686: Topics in Algebraic Combinatorics

Instructor: Michelle Wachs Galloway

Time: Tu, Th, 2:00 - 3:15 PM

This is the first semester of a year long sequence covering certain fundamental topics in algebraic and topological combinatorics. The first semester is an introduction to representations of the symmetric group and symmetric function theory. The second semester will include topics from the course I gave on poset topology at the IAS / Park City Mathematics Institute Graduate Summer School in Geometric Combinatorics in 2004.

Topics:

- representation theory of the symmetric group and related groups
- symmetric function theory
- tableaux combinatorics
- topology of partially ordered sets and other combinatorial simplicial complexes

Prerequisite: MTH 562

Course requirements: problems sets

Text: Bruce Sagan, *The Symmetric Group, Representations, Combinatorial Algorithms & Symmetric Functions*, Graduate Texts in Mathematics **203**, Springer-Verlog, 2001.

Reference Texts:

- William Fulton, *Young Tableaux*, Student Texts **35**, London Mathematical Society, Cambridge University Press, 1997.
- Gordon James and Adalbert Kerber, *The Representation Theory of the Symmetric Group*, Encyclopedia of Mathematics and its Applications, Addison-Wesley Publishing Company, 1981.
- I.G. Macdonald, *Symmetric Functions and Hall Polynomials*, Oxford Science Publications, 1995.
- Richard Stanley, *Enumerative Combinatorics*, Vols. 1 and 2, Cambridge Studies in Advanced Mathematics **50,62**, Cambridge University Press, 1999.
- Michelle Wachs, *Poset Topology; Tools and Applications*, chapter of *Geometric Combinatorics*, Vol. 13, IAS/ Park City Mathematics Series, 2007. <http://www.math.miami.edu/~wachs/eprints.html> .