

Math 665 Symmetric functions Fall 2010

Instructor: Thomas Lam

Course webpage: <http://www.math.lsa.umich.edu/~tfylam/Math665.html>

Course Outline: The theory of symmetric functions lies at the intersection of combinatorics, representation theory, and algebraic geometry. This course is an introduction to the theory of symmetric functions from the combinatorial point of view. The first half (or two-thirds) of the course will introduce the basic bases of symmetric functions: monomial, elementary, homogeneous, power sum, and Schur functions, together with the basic combinatorial objects: Young tableaux and the Robinson-Schensted algorithm. In the second half of the course we will study some variations on Young tableaux and on Schur functions. This may include topics such as plane partitions, the plactic monoid, Stanley symmetric functions, chromatic symmetric functions, k -Schur functions, quasisymmetric functions, noncommutative symmetric functions and so on.

Prerequisites: None, but the course is aimed at graduate students and is intended to be challenging.

References:

Enumerative Combinatorics Vol. 2 by Richard Stanley

Young Tableaux by William Fulton

The Symmetric Group by Bruce Sagan

Symmetric Functions and Hall Polynomials by Ian Macdonald

Grading: Two or three problem sets will be given over the semester. At the end of the semester, you will be asked to write a short paper on some more advanced topic in symmetric functions of your choice.