

Discrete Mathematics Seminar

Time: Friday, 23 March 2012, 12:30-1:30 PM
Room: 238 Derrick Hall
Title: An Algebraist's Use of Berge's Theorem
Speaker: Dr. Susan Morey, Mathematics Department

Abstract:

A matching of a graph is a set of pairwise disjoint edges (no two edges share a vertex). A matching is a perfect matching if every vertex appears in one of the edges. The deficiency of a graph is the number of vertices that are not used in a maximum matching of a graph, which in a sense is a measure of how far away the graph is from having a perfect matching. Berge's Theorem gives a way to compute the deficiency of a graph. In recent joint work with Rafael Villarreal and José Martínez-Bernal, we used Berge's Theorem to prove an algebraic result. We first showed a result, effectively a corollary of Berge's Theorem, regarding the deficiency of a type of parallelization of a graph, and then through careful translation we were able to show that the sets of associated primes of powers of the edge ideal of a graph form an ascending chain. Very few classes of ideals are known for which the associated primes form a chain, but this property has been informally conjectured to hold for graphs since the mid 1990's. In this talk, I will cover the surprising proof. No prior knowledge of associated primes will be assumed.