AMS Graduate Student Seminar
Speaker: Jiuhua Hu

When: Thursday, Nov 12  5:15pm
Where: Hume 331
Title: Total domination polynomials of graphs
Joint work with E. Shan, S. Wang and B. Wei

Abstract: Given a graph $G$, a total dominating set $D_t$ is a vertex set that every vertex of $G$ is adjacent to some vertices of $D_t$ and let $d_t(G, i)$ be the number of all total dominating sets with size $i$. The total domination polynomial, defined as $D_t(G, x) = \sum_{i=1}^{\mid V(G) \mid} d_t(G, i)x^i$, recently has been the focus of considerable extended research in the field of domination theory. In this paper, we obtain the vertex-reduction and edge-reduction formulas of total domination polynomials. As consequences, we give the total domination polynomials for paths and cycles. Additionally, we determine the sharp upper bounds of total domination polynomials for trees and characterize the corresponding graphs attaining such bounds. Finally, we use the reduction-formulas to investigate the relations between vertex sets and total domination polynomials in $G$.

Keywords: Total dominating set; Total domination polynomial; Recurrence relation