Discrete Mathematics Seminar

Time: Friday, 22 April 2011, 12:30–1:30 PM
Location: 238 Derrick Hall
Title: On the Power Dominating Sets of Various Classes of Graphs
Speakers: Alexandra Ilic, Westlake High School, Austin
                Kevin Tian, Westwood High School, Austin

Abstract:

The performance of electrical networks is monitored by expensive Phasor Measure- ment Units (PMUs). It is economically beneficial to determine the minimum number of PMUs required to effectively monitor an entire network. In graph theory, this problem consists of finding a minimal set of vertices that 'observes' an entire graph according to a set of observation rules. In this study, we examine the power dominating numbers of three classes of graphs, namely K_4 crossings of cycles and/or paths, circulant graphs with edge separation sets of size at most 2, and n-dimensional cubes. We present original proofs that establish upper bounds on the power dominating numbers of these classes of graphs. Through our work, we defined new properties for certain classes of graphs related to the power dominating set problem. This research has direct applications in the energy industry, resulting in infrastructure cost-savings.