TEXAS STATE UNIVERSITY

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Discrete Mathematics Seminar

Time: Friday, 25 March 2016, 12:00 – 1:00 PM
Location: 237 Derrick Hall
Title: The Dehn–Sommerville Relations and the Catalan matroid
Speaker: Nicole Yamzon, PhD Student, San Francisco State University

Abstract:

The f-vector of a d-dimensional polytope P stores the number of faces of each dimension. When P is simplicial the Dehn–Sommerville relations condense the f-vector into the g-vector, which has length $\lceil \frac{d+1}{2} \rceil$. Thus, to determine the f-vector of P, we only need to know approximately half of its entries. This raises the question: Which $(\lceil \frac{d+1}{2} \rceil)$-subsets of the f-vector of a general simplicial polytope are sufficient to determine the whole f-vector? We prove that the answer is given by the bases of the Catalan matroid.