

THE MATHEMATICS DEPARTMENT PRESENTS

# A MATHEMATICS COLLOQUIUM

TUESDAY, June 2, 2009

BOND HALL 217

4:00 pm

**Title: Jordan Curve Theorem**

**Speaker: Suzannah White**, Western Washington University

**Abstract:** The Jordan Curve Theorem states that any simple closed curve divides the plane into two connected sets, the inside and the outside, each having the curve as its boundary. This theorem can be proved using  $k$ -chains, which are unions of faces, edges, or vertices in a grating on the plane. These chains form an abelian group, using the disjoint union of chains as addition. After chain boundaries are defined, we can say that two chains whose sum forms a boundary are homologous. The Fundamental Lemma and Alexander's Lemma develop convenient properties of chains in relation to connected, closed, and/or compact sets in the plane. Based on these lemmas, we can prove the Jordan Curve Theorem by focusing on line segments rather than complicated curves.

Refreshments will precede the talk at 3:30pm in Bond Hall 300  
courtesy of Dr. Donald Chalice