Discrete Mathematics Seminar

Time: Friday, 24 February 2012, 12:30-1:30 PM
Room: 238 Derrick Hall
Title: The Rotating Lock Puzzle and a Generalization
Speaker: Dr. Eugene Curtin, Mathematics Department

Abstract:

A circular lock has 4 buttons, equally spaced around the side. The buttons are aligned with internal switches each of which have two states, on and off. Pressing a button changes the state of the internal switch underneath. A move consists of selecting and simultaneously pressing some buttons. If a move sets all the switches to the same state, the lock opens. Otherwise, an internal disk on which the switches are mounted spins for a random amount of time, then stops with a possibly new alignment of internal switches with buttons. The circular order of the switches cannot change. What is the smallest number of moves needed to guarantee the opening of the lock, assuming you are given the lock in an unknown closed state?

Graduate and advanced undergraduate students (especially those who have had or are taking Modern Algebra) should find this talk very accessible and are encouraged to attend.