Department of Mathematics and Computer Science

Friday, December 2, 2016, 4:10 pm

COLLOQUIUM TALK

**Speakers: Andy Janes and Biranna Lytle (EIU)**

Old Main 2231

Graduate Student Presentations

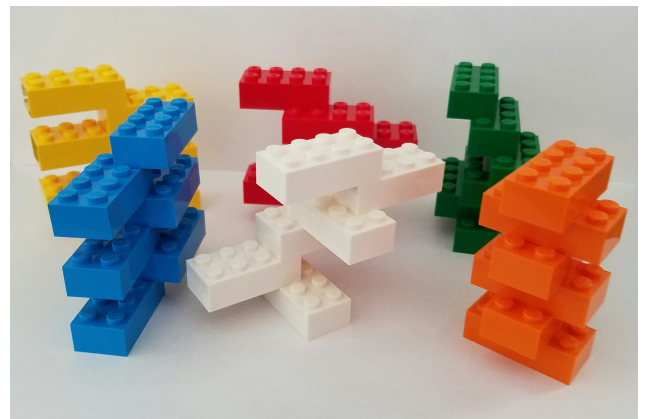## The Constrained Art Gallery Theorem

Speaker: Brianna Lytle

In the art gallery theorem, Chvátal uses a non-intuitive induction to prove that any polygonal art gallery with n vertices can be protected by at most $\lfloor \frac{n}{3} \rfloor$ stationary guards. In their paper, The Art Gallery Theorem, Revisited, Michael and Pinciu discuss their constrained art gallery theorem: If V^* and E^* are vertices and edges that must have guards, then the polygon can be protected by at most $\lfloor \frac{n+2|V^*|+|E^*|}{3} \rfloor$. The authors give two proofs to support this claim. The first is simple induction, based off Chvátal's proof and the second uses graph coloring based on the work of Fisk.
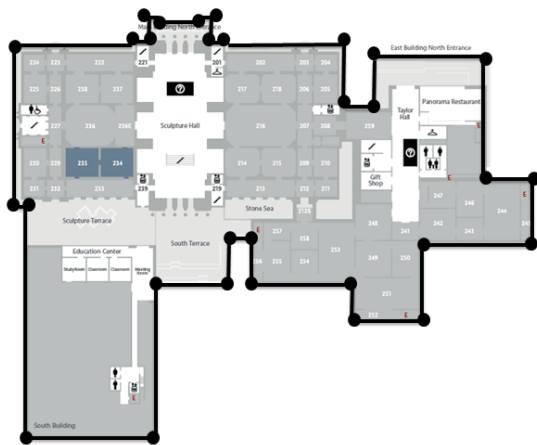
The LEGO Counting Problem

Speaker: Andy Janes

We detail the history of the problem of deciding how many ways one may combine n 2×4 LEGO bricks, and explain what is known—and not known—about the related question of how these numbers grow with n.