TUESDAY, APRIL 28
Lockett 235

3:15 – 3:35

Introduction to Varieties

Laura Rider

Finding roots of polynomials (or zeros in the case of several variables) is one of the oldest problems in mathematics. Given a set of polynomials J, we can define their variety, which is the set of zeros shared by all polynomials in J. Some common examples of varieties include lines, circles, parabolas and other plane curves. Similarly, we can define an "almost" inverse for a variety. This is a natural environment to begin the study of algebraic geometry. We will conclude with a proof of Hilbert's Nullstellensatz over $\mathbb{C}$.

3:35 – 3:55

An Introduction to Black-Scholes Option-Pricing Model

Dongxiang Yan

The purpose of this paper is to present the Black-Scholes formula which is one of the most important option-pricing models. We will show not only what the parameters of the formula mean but also how and why the formula works. We try to explain the basic principle behind the formula and how is the Black-Scholes formula mathematically derived.

3:55 – 4:15

When is $K_{1,n}$ not a Minor?

B. Nicholas Wahle

This talk will start out with some basic definitions of graph theory. The most important concept to be covered is that of the minor relation in graphs. Specifically we will ask when $K_{1,n}$ is not a minor of an arbitrary graph. As the talk will show, some of the initial cases are simple. Since this problem quickly gets complicated, the talk will also provide a generalization for larger values of n.

4:15 – 4:35

The Cauchy Functional Equation
Yi Zhang

Functional equations arise in both pure and applied mathematics and have many applications. Among these, the Cauchy functional equation is one of the simplest functional equations. However, the general solution to the Cauchy functional equation is not easy though one can easily find a continuous solution. This paper will introduce the concept of Hamel basis and use it to construct an example of a discontinuous solution. At the end of the paper, a measurability condition will be given to ensure the existence of a continuous solution. This result is interesting since nontopological properties (homomorphism and measurability) implies a topological property (continuous).