Mathematics in the Operating Room
Emily Thren
Did you ever want to know how mathematics could aid plastic surgeons in the operating room? In this talk, with Euclid's help, we explore how changing the cut angle on a skin graft used by a plastic surgeon minimizes the skin wasted, while reducing the scaring and pain for a patient. We will also be able to determine how large a wound we can cover if we restrict the size of the graft.

Discrete Logarithms in Cryptography
Kevin Cable
How can two parties communicate secretly while a third party listens? In this presentation, the ElGamal cryptosystem for securing information between two parties will be explored. With new techniques for encrypting information, there have also been advances in algorithms used by a third party to extract the information sent between the two parties. One such algorithm that will be analyzed and explained is the Pohlig-Hellman algorithm.

Continuous Dependence on Modeling for the Backward Heat Equation
Conor Finn
The one-dimensional backward heat equation is a partial differential equation that describes how an initial distribution of heat over a surface came to be. If this initial distribution is uniform, though, the heat might have originated from any one of a number of different locations. For this reason, the backward heat equation is what is known as ill-posed. In this talk, we plan to introduce a similar partial differential equation that is well-posed, and show that solutions to this equation accurately (within some controllable parameter value!) approximate solutions to the backward heat equation.