Title: A Theorem of Frobenius

Abstract:
Consider the irreducible polynomial \( f(x) = x^3 - x - 1 \). Let \( p \) be a prime and consider this as a polynomial over the finite field of \( p \) elements. Over this field the polynomial is either irreducible, splits into three linear factors, or splits into a linear factor and a quadratic factor. Frobenius proved a theorem which asserts that these 3 cases occur with frequencies: 1/3, 1/6, and 1/2. Why do these fractions occur? The answer is related to the fact that the Galois group of \( f \) is the symmetric group of 3 letters. Moreover, he considered how an irreducible polynomial factors when reduced modulo \( p \). In this talk I will explain Frobenius' theorem. This seminar will be accessible to undergraduate students who have taken Math 3400 (Group and Rings).

EVERYONE IS WELCOME!
