Department of Mathematics and Computer Science

Friday, February 8, 2019, 4:10 pm

COLLOQUIUM TALK

Speaker: Peter Andrews (EIU)

Old Main 2210

How A Chebyshev Polynomial Can Save Your Picture

Abstract:

The n^{th} Chebyshev Polynomial, $T_n(x)$, is the unique degree n polynomial with the intriguing property that $T_n(\cos t) = \cos nt$. These polynomials have plenty of interesting properties in their own right. This talk will explore some of them just because they are so much fun. But what I really want to discuss is how the roots of these polynomials play a crucial role in finding good polynomial approximations to a non-polynomial function.

The talk will touch on the issues involved in efficient polynomial approximations to functions, the errors involved, the Chebyshev Polynomials, and how it all fits together. Along the way we will see bases for vector spaces of polynomials and Newton's amazing Divided Differences algorithm.

A little calculus (as in some of Calc I) and a little trigonometry constitute all the background that is needed to follow the presentation.

SNACKS IN FACULTY LOUNGE AT 3:30 PM.
EVERYONE WELCOME (EVEN IF YOU ARE UNABLE TO ATTEND THE TALK)