

THE MATHEMATICS DEPARTMENT PRESENTS

A MATHEMATICS COLLOQUIUM

FRIDAY, May 22, 2009

BOND HALL 217

3:00 pm

Title: The Fourier Transform: Properties and Applications

Speaker: Jesse Nickerson, Western Washington University

Abstract: The Fourier Transform is a linear integral operator which can be defined on various function spaces. In this talk I will discuss some of its basic properties as well as its action taken on the Schwartz class of functions. In particular, we will examine its invertibility on the Schwartz space and its ability to interchange convolution with multiplication, and differentiation with multiplication by a linear factor. The interplay of these properties makes the Fourier Transform a highly effective tool in solving certain partial differential equations. This will be demonstrated by using it to solve the time-dependent heat equation in one dimension given a specified initial distribution of heat. I will also showcase the ability of the Fourier Transform to convert certain time-independent partial differential equations into algebraic equations. This talk will be accessible to anyone with some background in differential equations and analysis.

Refreshments will precede the talk at 2:30pm in Bond Hall 300
courtesy of Dr. David Hartenstine