MAT 598 -- Fourier Analysis and Wavelets, Spring 2017
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Course Description
Fourier series and Wavelets are important mathematical building blocks for signal analysis and many other areas in science and engineering. Fourier series is the study of how a function (or signal) can be decomposed into a sum of sine and cosine waves of various frequencies. Wavelets are similar to sines and cosines in that they look like waves of various frequencies. However, they are different in that wavelets have localized support (unlike sine and cosine waves which keep repeating forever). This localization feature of wavelets allows the user to filter or modify certain parts of the signal without affecting other parts.

This course will present an overview of Fourier and Wavelet Analysis along with some applications. The goal of this course is to present the general ideas behind the construction of Fourier series and Wavelets with a 50/50 mix of theory and computation/applications. The technical jargon of signal analysis and other fields of applications will be minimized.

This should be a valuable course for those involved with the *Research Training Grant program* or for anyone else interested in an introduction to the tools of signal analysis.

No prior knowledge of Fourier series or wavelets will be assumed. The prerequisites are a three semester calculus sequence, linear algebra (MAT 343) and being comfortable with epsilon-delta proofs in analysis. Some computer programming experience would be very helpful (especially with Matlab).