FS/EE 005 – Spring term – Prof. Changhuei Yang – Tuesdays @ 10:30-11:30AM

Instructor: Prof. Changhuei Yang (call me 'Young')
Office: 262 Moore
Telephone: 626-395-8922
Email: chyang at caltech dot edu

Click here to view some of the experiments lined up: http://www.biophot.caltech.edu/fsee005/

Course Description

This course is an intuitive introduction to waves. Have you ever wanted to break a wineglass with sound? Or make your own hologram? Or stand under a powerline with a fluorescent light tube? Have you ever wondered what a soliton wave or a vortex is? Come do this and more, as we dissect various types of wave phenomena mathematically and then see them in action with your own experiments. (1-5-0)

What is this course about?

In almost all measurement scenarios, you acquire a signal as it varies across time or space. A microphone picking up sound, for example. Or a photograph (variations of intensity over space).

The way you acquire such a signal and the way you process the signal is a very big part of Electrical Engineering. In this course, you will learn about Fourier analysis – a way in which we can recast time information into the frequency domain and vice versa. In a more basic context, Fourier analysis is one of a much broader class of methods and techniques for transforming information from one basis set to another – an idea that underpins some of the recent exciting scientific advancements, such as machine learning, compressive sensing and big data analysis.

We will discuss and explore a series of important features in Fourier analysis, through the study of waves. Our intention is for you to better appreciate and understand Fourier analysis through a fun experimental context.

In the current COVID pandemic (as of Aug 2020), we have designed and prepared a number of class kits to be mailed to students enrolled in this course (coordinated through the class TA) so that you can conduct the majority of the experiments at home.