ECE457 Fourier Optics

Concepts:
- Fourier transforms in optical systems
- Angular (wavenumber) Spectrum analysis of optical systems and propagation
- Scalar diffraction theory
- Optical Coherence
- Can compute diffraction of optical fields numerically and analyze with Fresnel and Fraunhofer propagation
- Can calculate imaging transfer functions for coherent and incoherent imaging system
- Can analyze and design optical Fourier processing systems
- Can design and numerically simulate a full complex optical system

Applications:
- Matlab simulation of propagation in optical systems
- Application of Fourier and linear systems to optical systems
- Gain intuitive understanding of optics and propagation
- Can compute diffraction of optical fields numerically and analyze with Fresnel and Fraunhofer propagation
- Can calculate imaging transfer functions for coherent and incoherent imaging system
- Can analyze and design optical Fourier processing systems
- Can design and numerically simulate a full complex optical system

Tools:
- ECE311 and ECE342
- Pre-requisites: Linear Systems Theory
- Fourier Transforms
- Basic Optics, Interference
- E&M, plane wave propagation
- Matlab simulation, FFT, etc.

IN

OUT