

ECE6501 Fourier Optics and Holography (3-0-3)

Prerequisites None

Corequisites None

Catalog Description Applications of the Fourier transform and linear systems theory to the analysis of optical propagation, diffraction, imaging, holography, wavefront modulation, and signal processing.

Textbook(s) Goodman, *Introduction to Fourier Optics* (3rd edition), Robert & Company Publishers, 2004. ISBN 9780974707723

Topical Outline

Basic Concepts

- Electromagnetic Waves

- Interference

- Interferometers

- Point-Sources

Optical Diffraction

- One-Dimensional Diffraction

- Fresnel Diffraction

- Pin Hole Camera

- Grating Diffraction

- Diffraction by 2D- and 3D-Periodic Structures

- Two-Dimensional Diffraction

Applications

- Holography

- Optical Signal Processing

- Quantitative Phase Imaging

- Fourier Transform Spectroscopy

- Optical Testing

Reference Information

- Electromagnetic Quantities, Symbols, and Units

- Reference Textbooks

- Fourier Transform Theorems