Catalog description: Interference of light, optical interferometry, Fraunhofer and Fresnel scalar diffraction, diffraction gratings, temporal coherence, spatial coherence, and partial coherence.

Recommended reading:

1. B. E. A. Saleh and M. C. Teich, *Fundamentals of Photonics*
2. J. W. Goodman, *Introduction to Fourier Optics*
3. M. Born and E. Wolf, *Principles of Optics*
4. A. Papoulis, *Systems and Transforms with Applications in Optics*
7. J. D. Gaskill, *Linear Systems, Fourier Transforms, and Optics*
8. E. Hecht, *Optics*
10. A.N. Matveev, *Optics*
11. M.V. Klein and T. E. Furtak, *Optics*

Syllabus:

1a. Review of the Fourier transform
1b. Review of electromagnetic, wave propagation, and the plane-wave angular spectrum
2a. Scalar diffraction theory
2b. Rayleigh-Sommerfeld diffraction
2c. Fresnel and Fraunhofer diffraction
2d. Diffraction limited optical imaging
2e. Diffraction gratings
3a. Interference and optical path difference (Double slit interference)
3b. Two-Beam Interference (Mach-Zehnder interferometer, Michelson interferometer, Sagnac interferometer)
3c. Multiple-beam interference
4a. Introduction to coherence theory
4b. Spatial and temporal coherence
4c. Effect of coherence on optical imaging