

ECE 4360: Fiber Optic Systems

Credit / Contact hours: 3 / 3

Course coordinator: Ayrton Bernussi

Textbook(s) and/or other required material: Gerd Keiser, Optical Fiber Communications, 4th Edition, Ed. McGraw-Hill (2010) ISBN-13: 978-0073380711

Catalog description: Optical fibers, couplers, sources, and detectors; applications to communications and sensing.

Pre-requisites: ECE 3312, ECE 3323

Designation: Elective

Course learning outcomes: Upon completion of this course, students should be able to do the following:

1. Analyze and describe the characteristics of optical components used in optical fiber communication systems and sensor systems.
2. Analyze and describe the characteristic of electro-optical components used in optical fiber communication systems and sensor systems.

ABET Student Outcomes addressed: a, e, and k.

Topics covered:

Fiber optics – 9 hours

- a) Optical fibers and light transmission
- b) Mode theory
- c) Attenuation and dispersion in fibers Photonic devices – 18 hours
- a) Semiconductor basics
- b) Optical sources (LED, LD) and the light coupling
- c) Optical modulators
- d) Photodetectors
- e) Optical receivers
- f) Optical amplifiers (SOA/EDFA/Raman)

Fiber optic communication – 9 hours

- a) Digital/analog optic communication links
- b) WDM concepts
- c) WDM components

Optical networks Fiber optic sensors 5 hours

- a) General principles, typical components, and applications