ECE 4360: Fiber Optic Systems

Credit / Contact hours: 3 / 3

Course coordinator: Zhaoyang Fan

Textbook(s) and/or other required material: Keiser, Optical Fiber Communications, McGraw Hill, 2000.

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.

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
  d) Optical networks
Fiber optic sensors 5 hours
  a) General principles, typical components, and applications