ECE 483 – Guided Wave Optics

Catalog Description:  Optical waveguides, optical fiber mode structure and polarization effects, fiber optical communication systems, fiber sensors, integrated optoelectronic devices. (Cross-listed as PH 483)

Credits: 4  
Terms Offered:  Spring

Prerequisites:  ECE 391X or PH 481 (concurrent enrollment acceptable)

Courses that require this as a prerequisite:  None

Structure:  Three 50-minute lectures plus one 3-hour lab per week

Instructors:  A. Wang

Course Content:
- Overview and safety issues of lasers and optical fibers: eyes, shocks, burns, splinters
- Photodetectors: physics, spectral and time response, circuit issues, noise
- Review of basic optics, laser mode properties, dispersion, data rates
- Planar dielectric waveguides and integrated optics
- Optical fiber waveguides: properties and fabrication
- Sources, modulation, system components, and system design
- Fiber sensors

Measurable Student Learning Outcomes:
At the completion of the course, students will be able to…
1. Explain the operation of LEDs, laser diodes, and PIN photodetectors (spectral properties, bandwidth, and circuits) and analyze their response in optical systems (ABET Outcomes: A, E, m)
2. Explain the principles of, compare and contrast single- and multi-mode planar and fiber optical waveguide characteristics (ABET Outcomes: A, E, m)
3. Analyze and design optical communication and fiber optic sensor systems (ABET Outcomes: A, C, E, m)
4. Design, build, and demonstrate a team optical fiber application project in the laboratory (ABET Outcomes: A, B, C, d, E, G, o)
5. Locate, read, and discuss current technical literature dealing with optical fiber systems (ABET Outcomes: a, G, i, j)

Learning Resources:
- Class notes

Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible
for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

**Link to Statement of Expectations for Student Conduct:**
http://oregonstate.edu/admin/stucon/achon.htm

Revised: 5/24/07