

## ECE 461 – Introduction to Analog and Digital Communications

**Catalog Description:** Fundamental concepts of analog and digital telecommunication systems: modeling, analysis, and design of analog amplitude and angle modulation systems; probabilistic performance assessment of modulated signals over noisy channels; introduction to baseband digital modulation techniques such as binary pulse amplitude modulation and pulse position modulation and their demodulation in the presence of random noise

**Credits:** 4                    **Terms Offered:** Fall

**Prerequisites:** ECE 351, ECE 352, ECE 353

**Courses that require this as a prerequisite:** ECE 462, ECE 463

**Structure:** Two 100-minute lectures per week

**Instructors:** H. Liu (primary), M. Magaña (secondary)

### Course Content:

- Analog amplitude modulation techniques
- Analog angle modulation techniques
- Baseband digital communication techniques
- Effect of noise on analog communication systems

### Measurable Student Learning Outcomes:

At the completion of the course, students will be able to...

1. **Apply** the fundamental concepts of analog and digital telecommunication systems (ABET Outcomes a, e, k, m, n)
2. **Characterize** the transmission medium random behavior (ABET Outcomes a, b, L, m, n)
3. **Analyze and design** basic analog and digital modulation schemes ABET Outcomes c, l, m, n, O)

Graduate students must also solve an extra exam problem within the exam time.

### Learning Resources:

- *Modern Digital and Analog Communication Systems*, B. P. Lathi, 3rd Edition, Oxford University Press, 1998

### 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: 5/14/07