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:** Enforced: ECE 351 and ECE 352 and 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)
4. ECE 561: Research problems of analog and digital telecommunications systems.
5. ECE 561: Analyze and design analog and digital modulations schemes to solve more complex problems of telecommunications.

**Learning Resources:**

**Evaluation of Student Performance:**
- Midterm exam I 25 %
- Midterm exam II 25 %
- Final exam 35 %
- Homework/project 15%

**ECE 561 students:** An extra course project will be required and factored into the grading.
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: 1/29/08