

ECE 323 – Electronics II

Catalog Description: Transient operation of MOSFETs and bipolar transistors; multistage amplifiers; frequency response; feedback and stability.

Credits: 4 **Terms Offered:** Fall, Spring

Prerequisites: ECE 322

Courses that require this as a prerequisite: ECE 422, ECE 431, ECE 433, ECE 499 CMOS, ECE 499 Sensors

Structure: Three 50-minute lectures per week

Instructors: P. Hanumolu (primary), A. Jander (secondary)

Course Content:

- New commands in SPICE
- Dynamic operation of digital circuits
- Transistor implementation of logic gates
- Clock generators and oscillators
- Frequency response
- Multistage amplifiers
- Feedback in circuits and analysis
- Laboratory projects: using new command in SPICE; CMOS logic; CMOS gates; infrared data link; oscillators; multimeter

Measurable Student Learning Outcomes:

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

1. **Describe** the dynamic operation of BJTs and MOSFETs (ABET Outcome A, e, m)
2. **Determine** the frequency response of basic amplifier configurations (ABET Outcome A, e, m, n)
3. **Analyze and design** multistage amplifier configurations (ABET Outcomes A, C, e, m, q)
4. **Evaluate** the effect of feedback and apply feedback analysis techniques (ABET Outcome A, e, k, m, n)
5. **Use** beyond the basic commands in the circuit simulator SPICE for analysis of electronic circuits (ABET Outcomes A, B, c, e, K, m)
6. **Design** a system to meet desired needs within realistic constraints and implement it (ABET Outcomes: A, B, C, E, I, K, m, O, Q)
7. **Work effectively** in professional teams utilizing appropriate communication skills (ABET Outcomes: D, G, p)

Learning Resources:

- *Microelectronic Circuits*, A. Sedra and K. C. Smith, Oxford University Press, Fourth Edition, 1998 (required).

- *SPICE for Microelectronic Circuits*, G. W. Roberts and A. Sedra, Oxford University Press, Second Edition, 1997 (optional).

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: 9/26/07