ECE 352 – Signals & Systems II

Catalog Description: Analytical techniques for continuous-time and discrete-time signal, system, and circuit analysis.

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

Prerequisites: ECE 351 and MTH 306; plus a working TekBot from ECE 112, 272, or 375

Courses that require this as a prerequisite: ECE 431, ECE 433, ECE 451, ECE 461, ECE 462, ECE 463, ECE 464, ECE 468, ECE 550

Structure: Three 50-minute lectures per week plus one 110-minute lab per week

Instructors: H.Liu (primary), T Nguyen

Course Content:
- Mixed Fourier representations and sampling theorem
- Communications system applications
- Laplace and Inverse Laplace transforms
- Z and Inverse-Z transforms
- Analog and digital filter applications
- Linear feedback system applications
- MATLAB for signal processing and communications applications

Measurable Student Learning Outcomes:
At the completion of the course, students will be able to…
1. **Analyze** continuous-time and discrete-time signals and systems in the frequency domain using mixed signal classes. Use MATLAB and laboratory experiments to **simulate and analyze** signals and systems of these cases (ABET outcomes: A, B, k, m, n)
2. **Explore** sampling concepts that link continuous-time and discrete-time signals and systems. Use MATLAB and laboratory experiments to **simulate and analyze** signals and systems for this situation (ABET outcomes: A, B, k, m, n)
3. **Apply** time-domain and frequency-domain analysis tools to communication system applications (ABET outcomes: A, c, j, k, l, m, n)
4. **Analyze** continuous-time signals and system responses using the concepts of transfer function representation by use of Laplace and inverse Laplace transforms. Use MATLAB and laboratory experiments to **simulate and analyze** signals and systems using these transforms (ABET outcomes: A, B, m, n)
5. **Analyze** discrete-time signals and system responses using the concepts of transfer function representation by use of Z and inverse-Z transforms. Use MATLAB and laboratory experiments **to simulate and analyze** signals and systems using these transforms (ABET outcomes: A, B, m, n)
6. **Apply** time-domain and frequency-domain analysis tools to analog and digital filters, and **use** MATLAB and laboratory experiments for applications of filters (ABET outcomes: A, B, j, K, m, n)

7. **Apply** time-domain and frequency-domain analysis tools to linear feedback systems, and **use** MATLAB and laboratory experiments for applications of control systems (ABET outcomes: A, B, j, m, n)

Learning Resources:

- *Signals and Systems*, 2nd Edition, S. Haykin and B. VanVeen, Wiley, 2003 (required)
- *Fundamentals of Signals and Systems Using the Web and Matlab*, Third Edition, E. Kamen and B. Heck, Prentice-Hall, Inc, 2007 (required)
- TekBot lab notes and manuals: http://eecs.oregonstate.edu/education/classes/ece352
- *Introduction to Matlab 7 for Engineers*, W. Palm III, McGraw Hill, 2005 (recommended)
- A.V. Oppenheim and A.S. Willsky, *Signals and Systems*, Second Edition, Prentice Hall, 1997 (optional)
- M.J. Roberts, *Signals and Systems*, McGraw Hill, 2004 (optional)
- Amos Gilat, *MATLAB: An Introduction with Applications*, Wiley, 2004 (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: 5/23/07