

ELEG 3123 – Analog Signal Processing

Spring 2007

Catalog data: Credit 3. Analog signals and systems. Time domain and frequency domain analysis and design of analog systems. Topics include: Fourier series, Fourier transforms, Laplace transforms, analog filter design and state-space analysis.

Prerequisite: ELEG 2113 (or ELEG 3903 and consent) and MATH 3404. (By topic: differential equations, concepts of linear algebra, Laplace transform, AC circuit analysis).

Co-requisite: ELEG 3121L

Textbook: Linear Systems and Signals, 2nd Edition by B.P. Lathi, Oxford University Press, 2005.

Instructor: Dr. W. Davis Harbour dharbour@uark.edu
3207A Bell Engineering Center (479) 575-4667
Office hours: MWF 1:30 – 3:30 pm, TTh 9:30 – 11:30 am or by appointment

Course Outline:

- Classification of signals and systems
- Classical solution of differential equations
- Zero-input response
- Convolution, impulse response and zero-state response
- Trigonometric and exponential Fourier series
- Fourier Transform and properties of Fourier Transform
- Laplace Transform and properties of Laplace Transform
- Solution of differential and integro-differential equations using Laplace transform
- Block diagrams and transfer function, system realization
- System description by state-space equations
- Solution of state-space equations
- Controllability and observability
- Frequency response of LTIC systems and Bode plots
- Analog filter design by placement of poles and zeros

Class meets: Bell 291, MWF 12:30 – 1:20 pm

Attendance: Mandatory. Students are responsible for all material covered in class. No late pick-up of class handouts other than tests and quizzes. No individual make-up of missed classes to be provided by the instructor.

Homework: Assigned but NOT collected and graded. A 10-15 minute weekly quiz consisting of one of the assigned homework problems will be given and graded.

Exams: Two 100-minute midterm exams and final exam (not comprehensive)

Grading: A: 81-100%, B: 71-80%, C: 61-70%, D: 51-60%, F: < 50%

Exam 1: 25%	Exam 2: 25%	Final Exam: 30%
Quizzes: 15%	Attendance: 5%	

ABET category content: Engineering Science: 2 credits or 67%
Engineering Design: 1 credit or 33%

Academic honesty:

Academic dishonesty will NOT be tolerated in this course. Any student guilty of academic dishonesty in this course will receive a grade of “F” for the course. Examples of academic dishonesty are as follows:

- Using unauthorized materials on an examination
- Copying from another student’s paper during an examination
- Receiving information from another student during an examination
- Giving information to another student during an examination
- Copying homework from another student

Working together on homework is recommended and encouraged, but each student is expected to work each assigned problem individually and understand the complete solution to each assigned problem. There is a difference between comparing notes and copying!

For complete details on the University of Arkansas policy on Academic Honesty, see the University Of Arkansas Catalog Of Studies.