ELECTRICAL AND COMPUTER ENGINEERING COURSE SYLLABUS

Instructor:	Prof. Henry Pfister	**E-mail:**	hpfister@tamu.edu
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Class Room:	ETB 1037 / ZACH 227A	**Class Time:**	MWF 10:20 / MWF 1:50

Course Name:	**ECEN 314**
Course Title:	**Signals and Systems**
Prerequisite(s):	ECEN 214, MATH 308
Required Text(s):	Signals and Systems by Oppenheim, Willsky, and Hamid (2nd Ed.) (SSOW)
Other Text(s):	Signals and Systems by Haykin and Van Veen (2nd Ed.) (SSHV)
	Schaum's Outline of Signals and Systems by Hwei Hsu (SSHH)

Course Objectives:

At the end of the course, the student should be able to:

1. Use basic mathematics including calculus, complex variables and algebra for the analysis and design of linear time-invariant systems used in engineering.

2. Describe signals mathematically and understand how to perform mathematical operations on signals. Be familiar with commonly used signals such as the unit step, ramp, impulse function, sinusoidal signals and complex exponentials. Classify signals (continous-time vs. discrete-time, periodic vs. non-periodic, energy signal vs. power signal, odd vs. even)

3. Understand various system properites such as linearity, time invariance, presence or absence of memory, causality, bounded-input bounded-output stability and invertibility. Identify whether a given system exhibits these properties and its implication for practical systems.

4. Understand the process of convolution between signals and its implication for analysis of linear time-invariant systems. Understand the notion of an impulse response.

5. Describe systems either using linear constant coefficient differential equations or using their impulse response. Find a state space representation of system from a block diagram and vice versa.

6. Understand the intuitive meaning of frequency domain and the importance of analyzing and processing signals in the frequency domain. Compute the Fourier series or Fourier transform of a set of well-defined signals from first principles. Use the properties of the Fourier transform to compute the Fourier transform (and its inverse) for more general signals.

7. Understand the application of Fourier analysis to filtering, amplitude modulation, and sampling.

8. Process continuous-time signals by first sampling and then processing the samples in discrete-time.

9. Use MATLAB programming to solve problems involving in signals and systems.

Student Evaluation:

Homework	10%	Quizzes	15%
Midterm 1	20%	Midterm 2	20%
Final	25%	Projects	10%

- Exams will be closed book without calculators. Only pencils or pens are required.

- Quizzes are used to verify that you can solve the homework problems on your own.

Rules and Guidelines:

The class shall follow all established policies of TAMU. This includes the Aggie Honor Code and the Americans with Disabilities Act (ADA). The honor code is "An Aggie does not lie, cheat, or steal or tolerate those who do." and more information is available from `http://www.tamu.edu/aggiehonor`. The ADA is a federal anti-discrimation statute that provides comprehensive civil rights prtotection for persons with disabilities and more information is available from `http://disability.tamu.edu`. Links to these and other policies can be found at `http://www.ece.tamu.edu/~hpfister/courses.html`.

Course Topics:

Unit	Topics	Hours
1	Introduction and mathematical review	1
2	Signals: description, classification, and properties	6
3	Systems: linearity, time-invariance, causality	3
4	Systems: impulse response and convolution	6
5	Applications: sensors and communications	2
6	Fourier series and transforms	6
7	Frequency domain analysis	6
8	The sampling theorem	4
9	Differential equations and Laplace transforms	4
10	Exams and Course review	4
	Total Hours	42

Schedule:

Week	Date	Monday	Wednesday	Friday	Recitation	Notes
1	1/14	1	2	3	0	
2	1/21	X	4	5	1	
3	1/28	6	7	8	2	
4	2/4	9	10	11	3	
5	2/11	12	13	14	4	Guest MWF
6	2/18	15	16	Midterm 1	5	
7	2/25	17	18	19	6	
8	3/4	20	21	22	7	
X	3/11	X	X	X	X	Spring Break
9	3/18	23	24	25	8	
10	3/25	26	27	X	X	
11	4/1	28	29	Midterm 2	9	Tue. Last Q-Drop
12	4/8	30	31	32	10	
13	4/15	33	34	35	11	
14	4/22	36	37	38	12	
15	4/29	39	40/Tue	X	X	Mon. Last Lab

MWF 10:20 - Final Exam on Tuesday, May 7, 8:00 AM - 10:00 AM

MWF 1:50 - Final Exam on Tuesday, May 7, 3:30 PM - 5:30 PM