

The University of Texas at Tyler  
Department of Electrical Engineering

**EENG 4350.032: Special Topics in EE**

**Syllabus**

Catalog Description:

Introduction to modern digital processing. Basic building blocks, the basic math (Z-Transforms, Fourier Transforms, Fast Fourier Transforms), deterministic processing, FIR and IIR filters, polyphase filtering, introduction to statistical filtering, basic power spectral density.

Prerequisites: EENG 4311: Signals and Systems

Credits: ( 3 hours lecture, 0 hours laboratory per week )

Text(s): Oppenheim, Schafer. Discrete-Time Signal Processing, 2e. Prentice Hall, 1999.

Additional Material: MATLAB, Class Notes

Course Coordinator: Seyed Ghorshi, PhD

Topics Covered: (paragraph of topics separated by semicolons)

Discrete-Time signals and systems; Z transform; Sampling of Continuous time systems; Transform analysis of linear time-invariant systems; Filter design techniques; the DFT and FFT algorithms; Fourier analysis of signals using the DFT; DSP applications.

Evaluation Methods: (only items in dark print apply):

1. Examinations / Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Objectives<sup>1</sup>: By the end of this course students will be able to:

1. Discuss and describe DSP fundamentals: sampling, frequency analysis and filtering [1,2]
2. Simulate and Apply digital signal processing concepts to provide solutions to engineering problems [3,5]
3. Evaluate the performance of DSP implementations [3,5].

<sup>1</sup>Numbers in brackets refer to method(s) used to evaluate the course objective.

Relationship to Program Outcomes<sup>2</sup>: This course supports the following Electrical Engineering Program Outcomes, which state that our students will:

1. Graduates of the program will possess a breadth and depth of knowledge in electrical and computer engineering. [1,2,3]
2. Graduates of the program will possess and demonstrate oral and written communication skills. [1,2,3]
3. Graduates of the program will demonstrate the capability to perform independent learning and investigation. [2,3]

<sup>2</sup>Numbers in brackets refer to course objective(s) that address the Program Outcome.

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	3	hours
General Education Component:		hours

<u>Prepared By:</u>	Mark Humphries, Adjunct Professor	<u>Date:</u>	13 January 2008
<u>Modified By:</u>	Hector A. Ochoa, Assistant Professor		3 June 2009
	Seyed Ghorshi, PhD		13 January 2019
			6 January 2020