

Course Codes: ELEC 5705

Course Title: Fundamentals of Data Converters

Pre-requisites or Co-requisite:
Electronics I & II or equivalent

Grading Scheme:

Item	Weight
Midterm (1st Week of Nov)	40%
Project	30%
Class participation and assignments	30%
Total	100%

Textbook:

1. Principles of Data Conversion System Design by Behzad Razavi

ISBN: 978-0-780-31093-3 December 1994

2. Analog Integrated Circuit Design

by Ken Martin and David Johns

Week-by-week Description:

Week	Topics / Assignments	Reading / Assignment
1	Fundamental concepts of ADCs and DACs: SNDR, SFDR, ENOB, Quantization noise etc.	
2	Nyquist rate data converters: <ul style="list-style-type: none"> • Flash ADC • SAR ADC 	
3	Nyquist rate data converters (cont.): <ul style="list-style-type: none"> • Pipeline ADC • Sub-ranging ADC 	
4	Oversampled data converters: <ul style="list-style-type: none"> • 1st order delta sigma ADC • Higher order delta sigma ADC 	
5	Design Example of ADCs: <ul style="list-style-type: none"> • High resolution low speed ADC • High speed, moderate resolution ADC 	
6	Components of ADCs: Sample and hold, Comparator, reference generation and clock generation.	
7	Digital to Analog Converter (DAC): <ul style="list-style-type: none"> • Current mode DAC. • Voltage mode DAC. • Capacitive DAC. 	Mid term
8	Design study of 50+ GS/s 7-bit DACs	
9	Recent trends in data converters: time/phase domain data converter	
10	Characterization of ADCs and DACs	
11	Time interleaved ADCs	
12	Calibration of ADCs and DACs	
13		Project Presentation