

Course Code	ECE612	
Course Name	Mixed signal Design	
Credits	4	
Course Offered to	UG/PG	
Course Description	This course teaches mixed signal circuits, which are very important bolcks in many modern processors. It covers switched capacitor circuits, comparators, different types of DACs, nyquist and over sampling ADCs.	
Pre-requisites		
Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requiste (Other)
ECE315/ECE515 Analog CMOS Circuit Design	ECE213 Linear Circuits	Any or all system design courses in ECE

\*Please insert more rows if required

<b>Post Conditions*(For suggestions on verbs please refer the second sheet)</b>			
<b>CO1</b>	<b>CO2</b>	<b>CO3</b>	<b>CO4</b>
Students are able to design Switched Capacitor Circuits/Filters from given specifications	Students are able to design a comparator	Students are able to decide the class and design a DAC given the specifications.	Students are able to decide the class and design an ADC given the specifications

<b>Weekly Lecture Plan</b>			
<b>Week Number</b>	<b>Lecture Topic</b>	<b>COs Met</b>	<b>Assignment/Labs/Tutorial</b>
1	Intorduction to the course, Review of analog IC design, introduction to switched cap circuits (3)		The course will not have any assignments. However, the students have to do a project individually or as a group of no more than three students. The project will demand use of cadence and/or Mentor Graphic tools. The project also includes three presentations of 15 to 20mts. duration during the course.
2-4	Switched capacitor circuits (9)	CO1	
5	Data conversion characteristics(3)	CO3, CO4	
6-7	Sample and holds, comparators (6)	CO2	
8-10	DACs : Voltage and charge based DACs, Current steering DACs, DAC linearization, Sigma delta DACs and interpolation filtering (9).	CO3	
11-13	ADCs: Flash ADCs, Pipelined ADCs, SAR and slope ADCs and Sigma Delta ADC and decimation filters (9)	CO4	

**Assessment Plan**

Type of Evaluation	% Contribution in Grade
Mid-sem	25
End-sem	25
Project	50

\*Please insert more row for other type of Evaluation

**Resource Material**

Type	Title
Textbook	1. Rudy Van de Plassche, "Integrated Analog-To-Digital and Digital-To-Analog Converters", Springer-Science, 1994.
Textbook	2. Phillip E. Allen and Douglas R. Holberg, "CMOS Analog Circuit Design", Oxford University Press, Edition 3, 2013.
Textbook	3. Roubik Gregorian and Gabor C. Temes, "Analog MOS Integrated Circuits for Signal Processing", Wiley Student Edition, 2008.
Textbook	4. Behzad Razavi, "Design of Analog CMOS Integrated Circuits", McGraw Hill Education (India), 2002.