

ANALOG CIRCUITS

Course Code	19EC3403	Year	II	Semester	II
Course Category	Program Core	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	Design and analyze feedback amplifiers
CO2	Design and analyze Power amplifiers and oscillators
CO3	Realize linear and non-linear applications using op-amp
CO4	Design and understand various applications related to filter circuits and IC 555
CO5	Compare the performance of various types of ADC and DAC using Op-Amp

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3-High, 2: Medium, 1:Low)														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	3							2	3	2
CO2	3	3	2	2	3							2	3	2
CO3	3	3	2	2	3							2	3	2
CO4	3	3	2	2	3							2	3	2
CO5	3	3	2	2	3							2	3	2

Syllabus		
Unit No.	Contents	Mapped CO
I	Feedback Amplifiers: The general feedback structure, properties of negative feedback, basic feedback topologies, the series-shunt feedback amplifier, the series-series feedback amplifier, shunt-shunt and shunt-series feedback amplifiers, determining loop gain.	CO1
II	Oscillators: Basic principles of sinusoidal oscillators, op amp RC oscillator circuits, LC and crystal oscillators. Power amplifiers: Classification of output stages, class A output stage, class B output stage, class AB output stage, Power Transistors.	CO2
III	Operational Amplifiers: The ideal op amp, the inverting and non-inverting configuration, difference and instrumentation amplifiers, summing, scaling and averaging amplifiers, integrators, differentiators, logarithmic amplifiers, V/I and I/V converters, Comparators and waveform generators.	CO3
IV	IC Timers: Introduction, operating modes of the 555 timer, terminals of the 555 timer, free running mode and applications. Active Filter Design: LPF, HPF, BPF, BEF, all-pass filters.	CO4

	Voltage reference circuits: Power supplies: ripple removal and regulation.	
V	Data Converters: Digital to analog conversion process, voltage output DACs, multiplying DAC, DAC characteristics. Analog to Digital Converters: integrating ADC, successive approximation ADC, Flash converters: Principle of operation, Dual slope ADC, Remote control applications, ADC characteristics.	CO5

Learning Resources	
Text Books	
1. Adel S. Sedra, Kenneth C. Smith, Arun N. Chandorkar, Microelectronic Circuits, 6/e, Oxford University Press, 2013. 2. D Choudhury Roy, Shail B. Jain, Linear Integrated Circuits, New Age International, 2003 3. RamakanthGayakward, Op-Amps and Linear Integrated Circuits, 4/e, Pearson Education, 2007	
Reference Books	
1. BehzadRazavi, Fundamentals of Microelectronics, 2/e, Wiley Student Edition, 2013. 2. R.F Coughlin, F.F Driscoll, Op-Amps and Linear Integrated Circuits, 6/e, Pearson Education, 2008. 3. Sergio Franco, Design with Operational Amplifiers and Analog Integrated Circuits, 3/e, Tata Mc-Graw Hill, 2002.	
