Analog & Digital IC Applications

Course Code	23EC3501	**Year**	III	**Semester**	I
Course Category	PC	**Branch**	ECE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Pre requisites**	EDC, STLD
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		BL
CO1	**Understand** the fundamentals of different ICs, data converters and memories.	L2
CO2	**Apply** the concepts of IC 555 to solve problems related to timer circuits.	L3
CO3	**Compare** different data conversion techniques.	L3
CO4	**Apply** the knowledge of various digital ICs to solve digital design problems.	L3
CO5	**Analyze** various applications of op-amp.	L4

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**	**PO 10**	**PO 11**	**PO 12**	**PSO 1**	**PSO 2**
CO1	2				1							1	2	
CO2	3				1							1	2	
CO3	3				1							1	2	
CO4	2				1							1	2	
CO5	3	3			1							1	2	
Avg.	3	2			1							1	2	

Syllabus		
Unit No.	**Contents**	**Mapped CO**
1	**Operational Amplifier:** Ideal and Practical Op-Amp, Op-Amp Characteristics: DC and AC Characteristics, Features of 741 Op-Amp, Modes of Operation: Inverting, Non-Inverting, Differential Modes. Instrumentation Amplifier, Differentiators and Integrators, Comparators, Schmitt Trigger.	CO1, CO5
2	**Applications of op-amp and IC 555 Timer:** Introduction to Active Filters, Characteristics of Active Filters, Waveform Generators – Triangular and Square Wave Generators, IC555 Timer-Functional Diagram, Monostable and Astable Operations and their design.	CO1, CO2, CO5
3	**Data Converters:** Introduction, different types of DACs-Weighted resistor DAC, R-2R ladder DAC, Different Types of ADCs – Parallel comparator type ADC, Counter Type ADC, Successive Approximation ADC and Dual slope ADC, DAC and ADC Specifications.	CO1,CO3,
4	**Combinational Logic ICs:** Integrated Circuits related to decoders,	

	encoders, multiplexers, de-multiplexers, Code Converters, Comparators, Adders.	CO1,CO4,
5	**Sequential Logic ICs:** Integrated Circuits related to Latches, flip-flops, counters and shift registers. **Memories** - ROM Architecture, Types of ROMS, RAM Architecture, Static & Dynamic RAMs.	CO1,CO4

Learning Resources
Text Books
1. Ramakanth A. Gayakwad, Op-Amps & Linear ICs, 4th Ed., PHI, 2010. 2. Floyd and Jain, Digital Fundamentals, 8th Ed., Pearson, 2005.
Reference Books
1.D. Roy Choudhury, Linear Integrated Circuits, New Age International, 2nd Ed., 2003. 2.John. F. Wakerly, Digital Design Principles and Practices, 3rd Ed., Pearson, 2009.
e-Resources & other Digital Material
1. https://www.youtube.com/watch?v=lpXNCwsnxjM&list=PLuv3GM6-gsE3npYPJJDnEF3pdiHZT6Kj3 2. https://www.youtube.com/watch?v=g6CCJAbdkK8&list=PLHO2NKv71TvsSqYwVvUCZwNkY-jUyUHdS