ANALOG SYSTEMS

Course Code	20EC5401	**Year**	II	**Semester**	II
Course Category	MINOR	**Branch**	ECE	**Course Type**	
Credits	4	**L-T-P**	3-1-0	**Prerequisites**	BEEE
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	Understand the basic concepts of electronic devices & analog systems (L2)
CO2	Apply the knowledge of transistors to realize switch, amplifier, linear and non-linear applications of op-amp (L3)
CO3	Apply the knowledge of op-amps & IC 555 timer to implement active filters, data converters & Multivibrators (L3)
CO4	Analyse the op-amp and 555 IC Timer based circuits to solve the given problem or to justify the given situation (L4)

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)
Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation
* - Average value indicates course correlation strength with mapped PO

Cos	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PS O2**
CO1	2									2				
CO2	2								2	2				
CO3	3								3	3				
CO4		3							3	3				3
Average* (Rounded to nearest integer)	2	3							3	3				3

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Introduction to Electronic devices** : PN diode-Construction, forward bias, reverse bias, V-I characteristics. BJT- Construction (NPN), CE characteristics, BJT as switch and amplifier. Advantages of FET over BJT, FET classification, MOSFET- Construction (N-channel Enhancement type)	CO1,CO2

II	**Operational Amplifiers** : Block diagram, Ideal characteristics, practical characteristics for IC 741 op-amp, Linear applications- Inverting amplifier, Non Inverting amplifier, Adder, subtractor. non-linear applications- Comparator, Astable Multivibrator, Monostable Multivibrator	CO1,CO2 ,CO4
III	**Active Filters**: Introduction, classification, Butter worth filters – 1st order, 2nd order LPF, HPF, Band pass, Band reject filters, All pass filters.	CO1,CO3 ,CO4
IV	**D/ A & A/ D Converters**: Specifications, weighted resistor DAC, R2R ladder DAC, inverted R-2R DAC, parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC.	CO1,CO3 ,CO4
V	**IC 555 TIMER**: Introduction to 555 timer, functional diagram, Monostable, Astable operations and applications, Schmitt Trigger.	CO1,CO3 ,CO4

Learning Resources
Text Books
1. Ramakanth A. Gayakwad- Op-Amps and Linear Integrated Circuits,- PHI, 4th Ed., 2009 2. J.Milliman, C.C Halkias - Electronic Devices and Circuits, Tata Mc-Graw Hill, 2nd Ed., 2007
Reference Books
1. D Roy Choudhury, Shail B. Jain, Linear Integrated Circuits, New Age International, 2003 2. J.Milliman, C.C Halkias- Integrated Electronics, Tata Mc-Graw Hill, 2nd Edition, 2007
e- Resources & other digital material
1. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-012-microelectronic-devices-and-circuits-fall-2009/lecture-notes/ 2. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-002-circuits-and-electronics-spring-2007/video-lectures/lecture-20/ 3. https://nptel.ac.in/courses/108105158 4. https://nptel.ac.in/courses/108108111