LINEAR AND DIGITAL IC APPLICATIONS LABORATORY

V Semester: ECE									
Course Code	Category	Hours / Week			Credits	Maximum Marks			
AECB21	Core	L	Т	Р	С	CIA	SEE	Total	
		-	-	2	1	30	70	100	
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 24 Total Classes: 24				es: 24			

I. COURSE OVERVIEW:

Linear and digital IC applications lab enables to learn design, testing and describing of circuit performance with digital and analog integrated circuits. It focuses on applications of special ICs and apply the techniques for the design of 741 ICs, applications of 555 timers, data converters and digital IC's for combination and sequential circuits design. This course provides practical hands-on experiments to analyze characteristics of commercially available digital integrated circuits.

II. OBJECTIVES:

The course should enable the students to:

- I The experiments on design of Linear and Digital Integrated circuits using operational amplifier and digital ICs.
- II The design and implementation of analog circuits and gain the hands-onexperience on the various building blocks of digital circuits.
- **III** The IC based real-time applications in the fields of communication systems and home-based automation systems.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

- CO 1 **Design** linear Integrated circuits to perform mathematical operations and voltage Create gain calculations using IC741.
- CO 2 Plot the frequency response of second order active filters usingIC 741 Apply
- CO 3 **Determine** the frequency of oscillations of multi-vibrators using IC741 and Apply IC555 timer.
- CO 4 **Obtain** the capture range and lock-in range of phase locked loop circuit using Apply IC565.
- CO 5 Construct the low and high voltage regulators to find the percentage of Apply regulation using IC723.
- CO 6 **Implement** combinational and sequential circuits using digital ICs to verify Apply their functionality.

LIST OF EXPERIMENTS

WEEK - I INVERTING, NON-INVERTING AND DIFFERENTIAL AMPLIFIERS

To construct and test the performance of an Inverting, Non-inverting amplifier and Differential amplifier using IC741.

WEEK-2	INTEGRATOR AND DIFFERENTIATOR
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To construct and test the performance of an Integrator and Differentiator using IC 741.

WEEK-3 SECOND ORDER ACTIVE LOWPASS, HIGHPASS AND BANDPASS FILTERS

To design and verify the operation of the Active low pass and High pass using IC 741.

WEEK-4	SECOND ORDER ACTIVE BAND PASS AND BANDREJECT FILTERS			
To design and	d verify the operation of the Band pass and Band reject filters using IC 741.			
WEEK -5	ASTABLE MULTIVIBRATORS USING 555			
To design and	l construct an astable multivibrators using IC 555.			
WEEK -6	MONOSTABLE MULTIVIBRATORS 555			
To design and	d construct Monostable multivibrators using IC 555.			
WEEK -7	SCHMITT TRIGGER USING 555			
To design and	d construct schmitt trigger using NE555 Timer.			
WEEK -8	PLL USING IC 565			
Verifying ch	aracteristics of PLL.			
WEEK -9	INSTRUMENTATION AMPLIFIER			
To design and	l verify the operation of instrumentation amplifier using IC 741.			
WEEK-10	DIGITAL TO ANALOG CONVERTER			
. To design ar	nd verify the operation of R-2R and Inverted R-2R DAC Converter using IC 741.			
WEEK-11	IC 723			
To design and	l implement voltage regulator using IC 723.			
WEEK-12	RTL LOGIC			
Verify Functi	onality of NOR and NAND gate using RTL Logic.			
WEEK-13	DTL LOGIC			
Verify Functi	onality of NOR and NAND gate using DTL Logic.			
Text Books:				
 D. Roy Chowdhury, "Linear Integrated Circuits", New age international (p) Ltd, 2nd Edition,2003 Ramakanth A. Gayakwad, "Op-Amps & linear ICs", PHI, 3rdEdition,2003. John F. Wakerly, "Digital Design Principles and Practices", Prentice Hall, 3rdEdition,2005. 				
Reference	Books:			
1. Salivaha	nan, "Linear Integrated Circuits and Applications", TMH, 1 st Edition, 2008.			
Web Referer	aces:			

- http://www.ee.iitkgp.ac.in
 http://www.citchennai.edu.in

SOFTWARE AND HARDWARE REQUIREMENTS FOR A BATCH OF 24 STUDENTS:

HARDWARE: Trainer kits, Analog and Digital ICs (IC741,555,74XX)