INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

LINEAR AND DIGITAL IC APPLICATIONS LABORATORY								
IV Semester: ECE | EEE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
AECE15	**Core**	0	0	2	1	40	60	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 36**				**Total Classes: 36**		
Prerequisite: Electronic Devices and Circuits, Digital System Design								

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. COURSES OBJECTIVES:
The students will try to learn

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

III. COURSE OUTCOMES:
At the end of the course students should be able to:

CO1 Design linear Integrated circuits to perform mathematical operations and voltage Create gain calculations using IC741.
CO2 Plot the frequency response of second order active filters using IC 741
CO3 Determine the frequency of oscillations of multi-vibrators using IC741 and Apply IC555 timer.
CO4 Obtain the capture range and lock-in range of phase locked loop circuit using Apply IC565.
CO5 Construct the low and high voltage regulators to find the percentage of Apply regulation using IC723.
CO6 Implement combinational and sequential circuits using digital ICs to verify Apply functionality.

IV.COURSE CONTENT

EXERCISE – l: INVERTING, NON-INVERTING AND DIFFERENTIAL AMPLIFIERS
To construct and test the performance of an Inverting, Non-inverting amplifier and Differential amplifier using IC741

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

EXERCISE -3 FREQUENCY RESPONSE OF LOWPASS AND HIGHPASS ACTIVE FILTERS
To design and verify the operation of the Active low pass and High pass using IC 741.

EXERCISE -4 FREQUENCY RESPONSE OF BANDPASS AND BAND REJECT ACTIVE FILTERS
To design and verify the operation of the Band pass and Band reject filters using IC 741.

EXERCISE -5 MONOSTABLE MULTIVIBRATOR USING 555 TIMER
To design and construct an monostable multivibrators using IC 555.

EXERCISE -6 ASTABLE MULTIVIBRATOR USING IC 555 TIMER
To design and construct a stable multivibrators using IC 555.

EXERCISE -7 SCHMITT TRIGGER CIRCUITS USING IC 741
To design and construct schmitt trigger using IC 741.

EXERCISE -8 PHASE LOCKED LOOP (PLL) USING IC 565
Verifying characteristics of PLL.

EXERCISE -9 VOLTAGE REGULATOR USING IC 723
To design and verify the operation of Voltage Regulator using IC 723.

EXERCISE -10 DIGITAL TO ANALOG (D/A) CONVERTER
To design and verify the operation of R-2R and Inverted R-2R DAC Converter using IC 741.

EXERCISE -11 RESISTOR-TRANSISTOR LOGIC(RTL)
To verify Functionality of NOR and NAND gate using RTL Logic.

EXERCISE -l2 DIODE-TRANSISTOR LOGIC(DTL)
To verify functionality of NOR and NAND gate using DTL Logic.

EXERCISE -l3 INSTRUMENTATION AMPLIFIER USING IC 741
To Verify Functionality of Instrumentation Amplifier using IC 741.

EXERCISE -l3 INSTRUMENTATION AMPLIFIER USING IC 741
To Verify Functionality of Instrumentation Amplifier using IC 741.

V.TEXT BOOKS:

1. D. Roy Chowdhury, “Linear Integrated Circuits”, New age international (p) Ltd, 2nd Edition,2003
   Ramakanth A. Gayakwad, “Op-Amps & linear ICs”, PHI, 3rdEdition,2003.
2. John F. Wakerly, “Digital Design Principles and Practices”, Prentice Hall, 3rdEdition,2005.

VI.REFERENCE BOOKS:

1. Salivahanan, “Linear Integrated Circuits and Applications”, TMH, 1st Edition, 2008.

VII.WEB REFERENCES:
1. http://www.ee.iitkgp.ac.in
   http://www.citchennai.edu.in
2. SOFTWARE AND HARDWARE REQUIREMENTS FOR A BATCH OF 24 STUDENTS:

VIII.MATERIALS ONLINE

1. Course outline Description
2. Lab Manual