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

COURSE CONTENT

LINEAR IC APPLICATIONS LABORATORY								
IV Semester: ECE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AECD16	Core	L	T	P	C	CIA	SEE	Total
		-	-	2	1	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45				Total Classes: 45		
Prerequisite: Electronic Devices and Circuits, Digital System Design								

I. COURSE OVERVIEW:
This course imparts hands-on knowledge for integrated circuit applications. It enables the students to design linear and non-linear applications using op-amp and pulse generation circuits using timer IC. Provide the capability to use vivado tool for performing the combinational and sequential circuits.

II. COURSES OBJECTIVES:
The students will try to learn

I. Implement different circuits and verify circuit concepts
II. Study the concepts of multi vibrators and filters
III. Verify the operations of the 555 timers and PLLs and their applications.
IV. Design and verify combinational and sequential circuits.

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

CO 1 Design linear Integrated circuits to perform mathematical operations and voltage gain calculations using IC741.
CO 2 Plot the frequency response of second order active filters using IC 741
CO 3 Examine the input and output characteristics of transistor (BJT and FET) configurations for determining input - output resistances.
CO 4 Obtain the capture range and lock-in range of phase locked loop circuit using IC565
CO 5 Construct the low and high voltage regulators to find the percentage of regulation using IC723
CO 6 Implement combinational and sequential circuits using digital ICs to verify their functionality

IV. LIST OF EXPERIMENTS:

WEEK-1: 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
To construct and test the performance of an Integrator and Differentiator using IC 741

WEEK-3: SECOND ORDER ACTIVE LOWPASS AND HIGHPASS 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 verify the operation of the Band pass and Band reject filters using IC 741

WEEK-5: ASTABLE MULTIVIBRATOR USING 555
To design and construct an astable multivibrator using IC 555

WEEK -6: MONOSTABLE MULTIVIBRATOR 555
To design and construct Monostable multivibrator using IC 555

WEEK -7: SCHMITT TRIGGER USING 555
To design and construct Schmitt trigger using NE555 Timer

WEEK -8: PLL USING IC 565
Verifying characteristics of PLL

WEEK -9: INSTRUMENTATION AMPLIFIER
To design and verify the operation of instrumentation amplifier using IC 741

WEEK -10: DIGITAL TO ANALOG CONVERTER
To design and verify the operation of R-2R and Inverted R-2R DAC Converter using IC 741

WEEK -11: IC 723
To design and implement voltage regulator using IC 723

WEEK -12: RTL LOGIC
Verify Functionality of NOR and NAND gate using RTL Logic

WEEK -13: DTL LOGIC
Verify Functionality of NOR and NAND gate using DTL Logic

WEEK -14: TTL LOGIC
Verify Functionality of NOR and NAND gate using TTL Logic

IV. TEXT BOOKS:

1. D. Roy Chowdhury, “Linear Integrated Circuits”, New age international (p) Ltd, 2nd edition, 2003
2. Ramakanth A. Gayakwad, “Op-Amps & linear ICs”, PHI, 3rd Edition, 2003.

V. REFERENCE BOOKS:

1. John F. Wakerly, “Digital Design Principles and Practices”, Prentice Hall, 3rd edition, 2005.

VI. ELECTRONICS RESOURCES:

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

VII. MATERIALS ONLINE

1. Course template
2. Lab Manual