ANALOG AND PULSE CIRCUITS LABORATORY

IV Semester: ECE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AECC13	Core	0	0	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36				Total Classes:36		

Prerequisite: There are no prerequisites to take this course.

I. COURSE OVERVIEW:

This laboratory course builds on the lecture course "Electronic circuit analysis" and “pulse and digital circuits” which is mandatory for all students of electronics and communication engineering. The course aims at practical experience with the characteristics and theoretical principles of linear and non linear devices and pulse circuits.

II. COURSE OBJECTIVES:

The students will try to learn:

I. Single stage and multi stage amplifiers and oscillators.
II. The principles of feedback amplifiers and oscillators through simulation.
III. The operations of circuits for linear and nonlinear wave shaping.
IV. The characteristics of different multivibrators.

III. COURSE SYLLABUS:

Week – 1: BASIC AMPLIFIERS/ LINEAR WAVESHAPING

a. Simulate frequency response of common emitter amplifier and common base amplifier.
b. Design RC low pass and high pass circuit for different time constants.

Week – 2: BASIC AMPLIFIERS/ LINEAR WAVESHAPING

a. Design RC low pass and high pass circuit for different time constants
b. Simulate frequency response of common emitter amplifier and common base amplifier.

Week – 3: TWO STAGE RC COUPLED AMPLIFIER/ NON-LINEAR WAVESHAPING

a. Simulate frequency response of two stage RC coupled amplifier.
b. Design transfer characteristics of clippers and clampers

Week – 4: TWO STAGE RC COUPLED AMPLIFIER/ NON-LINEAR WAVESHAPING

a. Design transfer characteristics of clippers and clampers.
b. Simulate frequency response of two stage RC coupled amplifier.

Week – 5: SINGLE TUNED AMPLIFIERS/ TRANSISTOR AS A SWITCH

a. Simulate a single tuned amplifier.
b. Design of transistor as a switch. styles

Week – 6: SINGLE TUNED AMPLIFIERS/ TRANSISTOR AS A SWITCH

a. Design of transistor as a switch.
b. Simulate a single tuned amplifier.

Week – 7: FEEDBACK AMPLIFIERS/ COMPARATOR

a. Simulate voltage series feedback amplifier and current shunt feedback amplifier.
b. Design of comparator circuit.

Week – 8: FEEDBACK AMPLIFIERS/ COMPARATOR

a. Design of comparator circuit.
b. Simulate voltage series feedback amplifier and current shunt feedback amplifier

Week – 9: RC PHASE SHIFT OSCILLATOR USING TRANSISTOR/ MULTIVIBRATORS

a. Simulate sine wave generated for a particular frequency by an RC phase shift oscillator.
b. Design different types of multivibrators and plot its waveforms.

Week – 10: RC PHASE SHIFT OSCILLATOR USING TRANSISTOR/ MULTIVIBRATORS

a. Design different types of multivibrators and plot its waveforms.
b. Simulate sine wave generated for a particular frequency by an RC phase shift oscillator.

Week – 11: OSCILLATORS/ SCHMIT TRIGGER

a. Simulate sine wave generated for a particular frequency by Colpitts and Hartley oscillator.
b. Design a Schmitt trigger circuit.

Week – 12: OSCILLATORS/ SCHMIT TRIGGER

a. Design a Schmitt trigger circuit.
b. Simulate sine wave generated for a particular frequency by Colpitts and Hartley oscillator.

Week – 13: POWER AMPLIFIERS/ UJT AS A RELAXATION OSCILLATOR

a. Simulate class A power amplifier (transformer less) and class B power amplifier.
b. Design of UJT as a relaxation oscillator.

Week – 14: POWER AMPLIFIERS/ UJT AS A RELAXATION OSCILLATOR

a. Design of UJT as a relaxation oscillator.
b. Simulate class A power amplifier (transformer less) and class B power amplifier.

IV. REFERENCE BOOKS:

1. Jacob Millman, Herbert Taub , Mothiki S. PrakashRao, "Pulse Digital and Switching Waveforms", Tata McGraw-Hill, 3rd Edition, 2008.
2. David A. Bell, "Solid State Pulse Circuits", PHI, 4th Edition, 2002.
3. J. Millman, C. C. Halkias, "Integrated Electronics", Tata McGraw-Hill. 1st Edition, 2008.
4. B. P. Singh, Rekha Singh, "Electronic Devices and Circuits", Pearson, 1st Edition, 2006.
5. Behzad Razavi, "Design of Analog CMOS Integrated Circuits", Tata McGraw-Hill, 1st Edition, 2002.

V. WEB REFERENCES:

1. http://www.tedpavlic.com/teaching/osu/ece327/
2. http://www.ee.iitkgp.ac.in