Department of Electronics and Communication Engineering
Basic Electronics Lab

Instructional Objectives:

- To understand the characteristics of basic electronic devices.
- To verify the basic laws and theorems of electric circuits.
- To design and test various amplifier and its frequency response.
- To design and test the analog and digital circuits and verify its performance.
- To design and test performance various circuits using SPICE software.

Students Outcomes:

At the end of the course, the student will be able to:

- Selection of the devices and components for various applications.
- Reduce the complex circuits into a simplified circuits.
- Design various amplifiers as per the required gain and bandwidth.
- Design combinational and sequential circuits.
- Analyze the performance of amplifiers, oscillators and power supplies using SPICE software and HDL for digital circuits.

Major Equipments available in the Lab

S. No.	Name of the Equipments	Specification	Quantity
1	Cathode Ray Oscilloscope (CRO)	0-30 MHz	15
2	Function Generator (FG)	0-3 MHz	15
3	Dual Regulated Power Supply (DRPS)	0-30V / 2A	10
4	Various electronics components	Adequate Nos.	
5	Ammeters, Voltmeters, Multi meters		

Courses Offered

S.No.	ODD Semester	Class	No. of Sessions	EVEN Semester	Class	No. of Sessions
1	Analog and Digital Circuits Laboratory	3rd Sem ECE	4	Circuits and Devices Laboratory	2nd Sem ECE	4
2	Electronics Laboratory	3rd Sem EEE	2	Circuits and Simulation Laboratory	4th Sem ECE	4
	Percentage of Lab Utilization : 60%			Percentage of Lab Utilization : 80%		

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List of Experiments

Circuits and Simulation Laboratory   **IV Sem ECE**

Design, Test and Analysis of

01. Series and Shunt feedback amplifiers-Frequency response, input and output impedance

02. RC Phase shift oscillator and Wien Bridge Oscillator

03. Hartley Oscillator and Colpitts Oscillator

04. Single Tuned Amplifier

05. RC Integrator and Differentiator circuits

06. Astable and Monostable multivibrators

Simulation Using Spice

01. Tuned collector oscillator

02. Twin -T oscillator / Wein Bridge oscillator

03. Double and Stagger tuned Amplifiers

04. Bi-stable Multivibrator

05. Schmitt Trigger circuit with predictable hysteresis

06. Analysis of power amplifier

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List of Experiments

Analog and Digital Circuits Laboratory　　　　　　**III Sem ECE**

Analog Experiments

01. Design of regulated power supplies.
02. Frequency response of CE, CB, CC and CS amplifiers.
03. Darlington amplifier.
04. Differential amplifiers - transfer characteristics, CMRR Measurement.
05. Cascode and cascade amplifiers.
06. Determination of bandwidth of single stage and multistage amplifiers.
07. Analysis of BJT with fixed bias and voltage divider bias using Spice .
08. Analysis of FET, MOSFET with fixed bias, self-bias and voltage dividerbias using simulation software like Spice.
09. Analysis of Cascode and Cascade amplifiers using Spice.
10. Analysis of frequency response of BJT and FET using Spice.

Digital Experiments

01. Design and implementation of code converters using logic gates
    i. BCD to excess-3 code and vice versa
    ii. Binary to Gray and vice-versa.
02. Design and implementation of 4 bit binary Adder/ Subtractor and BCD adder using IC 7483.
03. Design and implementation of Multiplexer and De-multiplexer using logic gates.
04. Design and implementation of encoder and decoder using logic gates.
05. Construction and verification of 4 bit ripple counter and Mod-10/Mod-12 Ripple counters.
06. Design and implementation of 3-bit synchronous up/down counter.

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List of Experiments

Circuits and Devices Laboratory   **II Sem ECE**

01. Characteristics of PN junction diode.
02. Zener diode characteristics & regulator using zener diode.
03. Common emitter input-output characteristics.
04. Common base input-output characteristics.
05. FET characteristics.
06. SCR characteristics.
07. Clipper and clamper & FWR.
08. Verifications of Thevinin & Norton theorem.
09. Verifications of KVL & KCL.
10. Verifications of super position theorem.
11. Verifications of maximum power transfer & reciprocity theorem.
12. Determination of resonance frequency of series & parallel RLC circuits.
13. Transient analysis of RL and RC circuits.

Electronics Laboratory   **III Sem EEE**

01. Characteristics of semiconductor diode and zener diode.
02. Characteristics of a NPN transistor under common emitter, common collector and common base configurations.
03. Characteristics of JFET and draw the equivalent circuit.
04. Characteristics of UJT and generation of saw tooth waveforms.
05. Design a frequency response characteristics of a common emitter amplifier.
06. Characteristics of photo diode & photo transistor, study of light activated relay circuit.
07. Design and testing of RC phase shift and LC oscillators.
08. Single phase half-wave and full wave rectifiers with inductive and capacitive filters.
09. Differential amplifiers using FET.
10. Study of CRO for frequency and phase measurements.