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| **ECL3501** | **Analog Electronics Lab** | **L-T-P: 0-0-3; Total 12 Sessions** |

***Prerequisites:*** Basic knowledge of Elements of Electronics Engineering and Solid State Devices. Fundamental electronic devices like diodes, transistors, and elementary circuits

***Course objectives:***

1. To study the simple BJT amplifier and its frequency response
2. To study practical realization of the basic op-amp circuits.
3. To study practical realization of nonlinear functions and circuits.
4. To study practical realization of sinusoidal and non-sinusoidal generators using op-amp and timer ICs.
5. To study working and applications of IC 555.

***Course Outcome:***

Upon successful completion of this course, students should be able to:

1. Work independently on electronic devices and ICs like 741 and 555 timer.
2. Developed and verified the understanding of linear and non-linear OPAMP circuit.
3. Ability to design various amplifier circuits using IC741
4. Design astable and mono-stable multi-vibrator using IC-555.
5. Design and test various op-amp circuits such as instrumentation amplifier, differentiator and integrator.
6. Have sound knowledge of basic circuit analysis and its behaviour and their practical limitations.

**List of Experiments**

Experiment No.1: Study of single stage RC coupled amplifier. Its frequency response and effect of emitter bypass capacitor.

Experiment No.2:

(a) Design of a first order RC Low Pass filter circuit & observing its frequency response and time response.

(b) Design of a first order RC high pass filter circuit & observing its frequency response and time response.

 Experiment No.3: Study inverting amplifier, non-inverting amplifier and voltage follower using op-amp IC741.

Experiment No.4. : (a) To measure slew rate of Op-Amp , (b) To measure full-power & unity gain bandwidth of Op-Amp

Experiment No. 5.: Application to Op-Amp (a) adder, (b) subtractor, (c) integrator and differentiator using op-amp IC741and observe output waveform for different input waveform.

Experiment No. 6.: To study the performance of instrumentation amplifier using op-amp IC741.

Experiment No. 7.: To study RC phase-shift oscillators using op-amp IC741.

Experiment No.8.: To study the Wien-bridge oscillators using op-amp IC741.

Experiment No. 9: To study Schmitt trigger circuits using op-amp IC741.

Experiment No.10.: Study of various radio frequency oscillators (Colpitts, Hartley etc.)

Experiment No.11.:Design of an astable multivibrator using IC 555 and measure the following parameters on CRO & compare them with theoretical values (a) Charging time (on time), (b) Discharging Time (off time), (c) % duty cycle.

Experiment No.12: Design of monostable multivibrator using IC555 and measurement of time period and frequency on CRO and compare them theoretical values.

 Experiment No.13.: Design of any innovative system using IC 741 and/or IC555.

**Book List**

Electronic Devices and Circuits by Millman and Halkias, McGraw Hills, New Delhi

Operational Amplifiers and Linear Integrated Circuits by Ramakant A. Gaykwad