Semester	IV	Course Title	Linear ICS And Communication Lab	Course Code	18 ECL 48
Teaching Period	50 Hours	L – T – P – TL*	0 – 0 – 3 – 3	Credits	2
CIE*	40 Marks	SEE*	60 Marks	Total	100 Marks

CREDITS – 02

Course objectives: This laboratory course enables students to:

- Design, Demonstrate and Analyze instrumentation amplifier, filters, DAC, adder, differentiator and integrator circuits, using op-amp.
- Design, Demonstrate and Analyze multivibrator and oscillator circuits using Op-amp
- Design, Demonstrate and Analyze analog systems for AM, FM and Mixer operations.
- Design, Demonstrate and Analyze balance modulation and frequency synthesis. Demonstrate and Analyze pulse sampling and flat top sampling.

Laboratory Experiments:

1. Design an instrumentation amplifier of a differential mode gain of _A' using three amplifiers.

2. Design of RC Phase shift and Wien's bridge oscillators using Op-amp.

3. Design active second order Butterworth low pass and high pass filters.

4. Design 4 bit R – 2R Op-Amp Digital to Analog Converter (i) using 4 bit binary input from toggle switches and (ii) by generating digital inputs using mod-16 counter.

5. Design Adder, Integrator and Differentiator using Op-Amp.

6. Design of Monostable and Astable Multivibrator using 555 Timer.

7. Demonstrate Pulse sampling, flat top sampling and reconstruction.

8. Amplitude modulation using transistor/FET (Generation and detection).

9. Frequency modulation using IC 8038/2206 and demodulation.

10. Design BJT/FET Mixer.

11. DSBSC generation using Balance Modulator IC 1496/1596.

12. Frequency synthesis using PLL.

Course Outcomes: This laboratory course enables students to:

- **Analyse** the working of differential amplifier, filters and calculate cut off frequency and roll off of filters and design oscillators for any frequency
- **Generate** R-2R DAC and also staircase wave using mod-16 counter, use adder and integrator and differentiator for suitable applications.
- **Demonstrate** the working of 555 timer and its applications and also can be able to generate amplitude modulation, frequency modulation and pulse amplitude modulation.
- **Gain** hands on experience in DSBSC generation, Mixer and PLL working.

Conduct of Practical Examination:

- All laboratory experiments are to be included for practical examination. Students are allowed to pick one experiment from the lot.
- Change of experiment is allowed only once and Marks allotted to the procedure part to be made zero.