

25UECL405	ELECTRONIC CIRCUITS II LAB	Category	L	T	P	R	Credit	Year of Introduction
		PCL	0	0	3	0	2	2025

Preamble: The Analog circuits II laboratory provides practical exposure to the design, implementation, and analysis of Op Amp and IC-based circuits. It enables students to verify theoretical concepts through hardware experiments and simulations, strengthening their understanding of analog circuit design and applications.

Prerequisite: 25UECL305 Electronic Circuits- I Lab

Course Outcomes: After the completion of the course, the student will be able to:

CO	Course Outcomes	Knowledge Level
CO1	Apply Op-Amp principles to realize basic linear integrated circuits.	K3 Apply
CO2	Apply linear IC concepts to realize basic linear integrated circuits.	K3 Apply
CO3	Apply simulation tools to analyze the operation of basic linear integrated circuits.	K3 Apply
CO4	Apply simulation techniques to evaluate the performance of linear integrated circuits.	K3 Apply

Mapping of course outcomes with program outcomes and program specific outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	3	2	-	-	-	-	3	3	-	3	3	2
CO2	3	3	2	-	-	-	-	3	3	-	3	3	2
CO3	3	3	2	-	3	-	-	3	3	--	3	3	3
CO4	3	3	2	-	3	-	-	3	3	-	3	3	3
Avg	3	3	2	-	3	-	-	3	3	-	3	3	2.5

Mapping of course outcomes with Knowledge and Attitude Profile (WK)

	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9
CO1	*	*	*	*	*			*	
CO2	*	*	*	*	*			*	
CO3	*	*	*	*	*	*		*	
CO4	*	*	*	*	*	*		*	

Wks Mapped with the course

WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9
*	*	*	*	*	*		*	

Mark Distribution:

Total Marks	CIE Marks	ESE Marks	ESE Duration
100	50	50	3 hrs

Continuous Internal Evaluation Marks (CIE):

Attendance	Preparation/Pre-Lab Work experiments, Viva and Timely completion of Lab Reports / Record (Continuous Assessment)	Internal Examination	Total
5	25	20	50

End Semester Examination Marks (ESE):

Procedure/ Preparatory work/Design	Conduct of experiment/ Execution of work/ troubleshooting	Result with valid inference/ Quality of Output	Viva voce	Record	Total
10	15	10	10	5	50

Submission of Record: Students shall be allowed for the end semester examination only upon submitting the duly certified record.

Endorsement by External Examiner: The external examiner shall endorse the record.

**Part A – List of Experiments using Op Amps
(Minimum seven experiments mandatory)**

1. Familiarization of Operational Amplifiers – Inverting and Non-inverting amplifiers, Integrator, Differentiator (Frequency response), Adder, Comparators.
2. Measurement of Op-Amp parameters.

3. Difference Amplifier and Instrumentation amplifier.
4. Schmitt trigger circuit.
5. Astable and Monostable multivibrators.
6. Waveform generators using Op Amps - Triangular and Sawtooth
7. Wien bridge oscillator - without & with amplitude stabilization.
8. RC Phase shift Oscillator.
9. Active first and second order filters (LPF, HPF, BPF and BRF).
10. Active Notch filter to eliminate the 50Hz power line frequency.
11. Precision rectifiers

Part B – Application circuits using ICs
[Minimum three experiments are to be done]

1. Astable and Monostable multivibrator using Timer IC NE555.
2. DC power supply using IC 723: Low voltage and high voltage configurations, Short circuit and Fold-back protection.
3. A/D converters- counter ramp and flash type.
4. D/A Converters - R-2R ladder circuit.
5. Study of PLL IC: free running, frequency lock range and capture range.

Part C – Simulation experiments

[The experiments shall be conducted using open tools such as QUCS, KiCad or variants of SPICE]

1. Simulation of any three circuits from experiments 3, 5, 6, 7, 8, 9, 10 and 11 of section I.
2. Simulation of experiments 3 or 4 from section II.

Text Books:

1. Choudhary, D. R., & Jain, S. B. (2021). *Linear integrated circuits* (6th ed.). New Age International (P) Ltd.
2. Rashid, M. H. (2015). *Introduction to PSpice using OrCAD for circuits and electronics* (3rd ed.). Pearson Education.

Reference Books:

1. Gayakwad, R. A. (2002). *Op-amps and linear integrated circuits* (4th ed.). Prentice-Hall of India.
2. Choudhary, D. R., & Jain, S. B. (2018). *Linear integrated circuits*. New Age International.