



ARSD College, University of Delhi

Lesson Plan

Course Name : B.Sc. (Physics Sc. Chemistry) Lab						
Semester	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
IV		Physics Lab- C X LAB: Analog Systems & Applications	0	0	4	2
Teacher/Instructor(s)		Dr. Manisha				
Session		2021-22				

Course Description:

- Sessions on setting up and performing experiment on a bread board and checking the working status of the circuit.
- Sessions on the use of specific measurement instruments and experimental apparatus used in the lab, including necessary precautions.
- Sessions on the review of experimental data analysis, sources of error and their estimation in detail, writing of scientific laboratory reports including proper reporting of errors. Application of the specific circuits learned in the theory.

List of Experiments:

At least 08 experiments from the following:

1. To study the V-I characteristics of a Zener diode and its use as voltage regulator.
2. Study of V-I & power curves of solar cells, and find maximum power point & efficiency.
3. To study the characteristics of a Bipolar Junction Transistor in CE configuration.
4. To study the various biasing configurations of BJT for normal class A operation.
5. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.
6. To study the frequency response of voltage gain of a two stage RC-coupled transistor amplifier.
7. To design a Wien bridge oscillator for given frequency using an op-amp.
8. To design a phase shift oscillator of given specifications using BJT.
9. To design a digital to analog converter (DAC) of given specifications.
10. To design an inverting amplifier using Op-amp (741,351) for dc voltage of given gain
11. (a) To design inverting amplifier using Op-amp (741,351) & study its frequency response. (b) To design non-inverting amplifier using Op-amp (741,351) & study frequency response.

12. To add two dc voltages using Op-amp in inverting and non-inverting mode(b) To study the zero-crossing detector and comparator.
13. To design a precision Differential amplifier of given I/O specification using Op-amp.
14. To investigate the use of an op-amp as an Integrator.
15. To investigate the use of an op-amp as a Differentiator.

Details of the Lab Course		
Session	Name of Experiment	Contact Hours
1	Experiment 1: To study the V-I characteristics of a Zener diode and its use as voltage regulator.	4
2	Experiment 2: Study of V-I & power curves of solar cells, and find maximum power point & efficiency.	4
3	Experiment 3: To study the characteristics of a Bipolar Junction Transistor in CE configuration.	4
4	Experiment 4: To study the various biasing configurations of BJT for normal class A operation.	4
5	Experiment 5: To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.	4
6	Experiment 6: To study the frequency response of voltage gain of a two stage RC-coupled transistor amplifier.	4
7	Experiment 7: To design a Wien bridge oscillator for given frequency using an op-amp.	4
8	Experiment 8: To design a phase shift oscillator of given specifications using BJT.	4
9	Experiment 9: To design a digital to analog converter (DAC) of given specifications.	4
10	Experiment 10: To design an inverting amplifier using Op-amp (741,351)for dc voltage of given gain	4
11	Experiment 11: (a) To design inverting amplifier using Op-amp (741,351) & study its frequency response (b) To design non-inverting amplifier using Op-amp (741,351) & study frequency response	
12	Experiment 12: (a) To add two dc voltages using Op-amp in inverting and non-inverting mode (b) To study the zero-crossing detector and comparator.	4
13	Experiment 13: To design a precision Differential amplifier of given I/O specification using Op-amp.	
14	Experiment 14: To investigate the use of an op-amp as an Integrator.	

15	Experiment 15: To investigate the use of an op-amp as a Differentiator.	
	Total	60

Suggested Books:

Sl. No.	Name of Authors/Books/Publishers	Year of Publication/Reprint
1.	Basic Electronics: A text lab manual, P.B.Zbar, A.P.Malvino, M.A.Miller, 1994, Mc-Graw Hill.	1994
2.	OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4 th edition, 2000, Prentice Hall.	2000
3.	Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.	2008
4.	Electronic Devices & circuit Theory, R.L.Boylestad & L.D.Nashelsky, 2009, Pearson	2009

Evaluation Scheme:

No.	Component	Duration	Marks
1.	Internal Assessment		25
	• Quiz/Viva		
	• Observation & Record		
	• Attendance		
	• Model Exam		
2.	End Semester Examination	5 hr	25