III B.Tech – I Semester
(20EC5110) ANALOG & DIGITAL IC APPLICATIONS LAB

Int. Marks	Ext. Marks	Total Marks		L	T	P	C
15	35	50		-	-	3	1.5

Pre-Requisites: None

Course Objectives:
- To design various DC and AC applications using IC 741 op-amp.
- To design a stable and monostable multivibrators using IC 555 timer.
- To verify the functionality of three terminal voltage regulators IC 78XX and IC 79XX.
- To simulate and synthesize various combinational logic circuits.
- To simulate and synthesize various sequential logic circuits.

Note: The students have to design the circuit using necessary hardware equipment and verify the result. Further the students have to develop VHDL code for combinational and sequential circuits and perform the simulation using Xilinx Vivado Design Suite.

List of Experiments: (Total 12 experiments are to be performed)
1. OP AMP Applications – Summing Amplifier, Difference Amplifier and Comparator.
2. Integrator and Differentiator using IC 741.
3. Active Filter Applications – 1 st order LPF, HPF & BPF.
4. Function Generator using IC 741.
5. Monostable Multivibrator using IC 555.
6. Astable Multivibrator using IC 555.
7. Schmitt trigger using IC 741, IC 555
8. Three Terminal Voltage Regulators-7805, 7905, 7912.
9. 4 bit DAC using IC 741.

Simulate and synthesize the following using Xilinx Vivado Design Suite.
10. 8- Bit comparator-7485.
11. 8 x 3 Encoder- 74148.
12. 16 x 1 using 4x1 mux.
13. D Flip-Flop- 7474
14. Decade counter -7490.

Equipment required:

Hardware:
1. Regulated Power supplies
2. Analog/Digital Storage Oscilloscopes
3. Analog/Digital Function Generators
4. Digital Multi-meters
5. Decade Resistance Boxes/Rheostats
6. Ammeters (Analog or Digital)
7. Voltmeters (Analog or Digital)
8. Active & Passive Electronic Components

Software required:
1. Xilinx Vivado software / Equivalent Industry Standard Software
2. Xilinx Hardware / Equivalent hardware
3. Personal computer system with necessary software to run the programs and Implement

Course Outcomes:

After successful completion of the course, the students can be able to

S. No	Course Outcome	BTL
1	Design various DC and AC applications using IC 741 op-amp.	L4
2	Design and analyse a stable and monostable multivibrators using IC 555 timer.	L4
3	Verify and plot the responses of three terminal voltage regulators.	L3
4	Simulate and synthesize various combinational logic circuits.	L4
5	Simulate and synthesize various sequential logic circuits.	L4

Correlation of COs with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	2	2	2	-	-	-	-	-	3	-	-	-	2	2
CO 2	2	2	2	-	-	-	-	-	3	-	-	-	2	2
CO 3	2	2	-	-	-	-	-	-	3	-	-	-	2	1
CO 4	2	1	2	-	2	-	-	-	3	-	-	1	2	2
CO 5	2	1	2	-	2	-	-	-	3	-	-	1	2	2