

III B.Tech I Semester

15AEC30 - IC APPLICATIONS LAB

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Note: The students are required to perform any Six Experiments from each Part of the following.

PART A: LINEAR IC APPLICATIONS***Course Objectives:***

1. To verify the applications of Op-amp
2. To verify applications IC555, IC565 and IC566
3. To use computer-aided design tools for development of complex digital logic circuits
4. To model, simulate, verify, analyze, and synthesize with hardware description languages
5. To design and prototype with standard cell technology and programmable logic
6. To design tests for digital logic circuits and design for testability

List of Experiments: (using Hardware)

1. Study the characteristics of negative feedback amplifier
2. Design of an Instrumentation amplifier
3. Study the characteristics of regenerative feedback system with extension to design an astablemultivibrator
4. Study the characteristics of integrator circuit
5. Design of Analog filters (2nd order bandpass filter and Notch filter)
6. Design of a function generator
7. Design of a Voltage Controlled Oscillator (VCO)
8. Design of a Phase Locked Loop (PLL)

Equipment required for Laboratories:

1. RPS
2. CRO
3. Function Generator
4. Multi Meters
5. ASLK Pro trainer kit
6. Analog IC Tester

Course Outcomes:

- a. Able to verify applications of Op-amp
- b. Able to verify applications of IC555 and IC566
- c. Able to use computer-aided design tools for development of complex digital logic circuits.
- d. Able to model, simulate, verify, analyze, and synthesize with hardware description languages.
- e. Able to design and prototype with standard cell technology and programmable logic.
- f. Able to design tests for digital logic circuits, and design for testability.

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PART-B: DIGITAL IC APPLICATIONS***Course Objectives:***

1. *To design and draw the internal structure of the various digital integrated circuits*
2. *To develop VHDL source code, perform simulation using relevant simulator and analyze the obtained simulation results using necessary synthesizer.*
3. *To verify the logical operations of the digital IC's (Hardware) in the laboratory.*

List of Experiments: (using Software)

1. Realization of Logic Gates.
2. 4 to 8 Decoder- 74138.
3. 8 x 1 Multiplexer-74151 and 2 x 4 De-multiplexer-74155.
4. 4-Bit Comparator-7485.
5. D Flip-Flop-7474.
6. Decade counter-7490.
7. Shift registers-7495.
8. ALU Design.

Equipment Required:

1. Xilinx ISE Software.
2. Personal Computers.

Course Outcomes: After completion of the course, the students is able to

- a *Design and draw the internal structure of the various digital integrated circuits*
- b *Develop VHDL source code, perform simulation using relevant simulator and analyze the obtained simulation results using necessary synthesizer.*
- c *Verify the logical operations of the digital IC's (Hardware) in the laboratory*

