

ELECTRONIC DEVICES AND DIGITAL LOGIC LAB (Common to CSE&IT)

II B. Tech. - I Semester
Course Code: A3EC71

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COURSE OVERVIEW:

Introductory experimental laboratory that explores the design, construction, and debugging of analog electronic circuits. Lectures and six laboratory projects investigate the performance characteristics of diodes, transistors, JFETs, and op-amps, including the construction of a small audio amplifier and preamplifier. Seven weeks are devoted to the design and implementation and written and oral presentation of a project in an environment similar to that of engineering design teams in industry. The course provides opportunity to simulate real-world problems and solutions that involve tradeoffs and the use of engineering judgment. Engineers from local analog engineering companies come to campus to help students with their design projects.

COURSE OBJECTIVES:

1. To teach modulation, demodulation techniques used in communication system, and develop the Modulation techniques used in both time and frequency domains.
2. To impart knowledge of pre-emphasis and de-emphasis circuits used in the analog communication
3. To familiarize the Signal Modulation (amplitude, frequency, and phase) and transmission techniques (base band, SSB system) will be emphasized.
4. To explain the concepts of mixer, PLL, Digital phase detector and synchronous detector to develop a clear insight into the relations between the input and output ac signals in various stages of a transmitter and a receiver of AM & FM systems

COURSE OUTCOMES:

1. Students will be able to analyze signals in time and frequency domain.
2. Students will be able to identify different analog modulation schemes; analyze and solve typical problems involving analog modulation/demodulation systems.
3. Students will be able to distinguish between different pulse modulation systems, multiplexing techniques and analyse PCM systems including effects of noise.
4. Students will be able to identify different digital modulation schemes, and design corresponding modulators/demodulators. They will be able to distinguish between different network topologies, protocols, data -flow and error control techniques, sand between synchronous and asynchronous transmission.
5. Students will be able to solve fundamental problems on entropy, information rate, source coding, coding efficiency and channel capacity

SYLLABUS

PART - A

ANALOG DEVICES AND CIRCUITS

1. Characteristics of PN Junction diode
2. Characteristics of Zener diode
3. Ripple Factor and Load Regulations of Half-wave Rectifier with and without filters
4. Ripple Factor and Load Regulations of Full-wave Rectifier with and without filters
5. Input and Output characteristics of Transistor in Common Emitter configuration
6. Drain and Transfer Characteristics of Junction Field Effect Transistor (JFET)
7. Gain and Frequency response of Common Emitter Amplifier
8. Gain and Frequency response of Feedback Amplifier (Voltage series or current series)
9. Heartley and Colpitts Oscillator
10. RC phase shift Oscillator

PART - B
DIGITAL CIRCUITS

1. Realization of Logic gates using discrete components
2. Binary Adders and Subtractors Comparators
4. Multiplexers
5. Decoders
6. Flip-Flops
7. Counters
8. Shift Registers