



INSTITUTE OF AERONAUTICAL ENGINEERING (Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

ANALOG AND DIGITAL COMMUNICATIONS LABORATORY								
IV Semester: ECE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
AECE13	Core	0	0	2	1	40	60	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36			Total Classes: 36			
Prerequisite: There are no prerequisites to take this course								

I. COURSE OVERVIEW:

Communication engineering is the field of study concerned with the transmission of information either in analog or digital form. The objective of this lab course provides a platform to the students to understand the basics of analog and digital communication systems, modulation techniques, data transmission, multiplexing, etc

II. COURSES OBJECTIVES:

The students will try to learn

- I. The basic theory of communication system in practice.
- II. The concept of analog to digital conversion for pulse modulation techniques
- III. The analog and digital modulation techniques using MATLAB tool.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

- CO 1: Discriminate the generation and detection of amplitude modulated and frequency modulated signals to calculate the modulation index and frequency deviation.
- CO 2: Analyze the analog pulse modulation and demodulation methods for transmitting the information by pulses
- CO 3: Apply the concept of pulse code modulation and demodulation for encoded data in analog to digital conversion
- CO 4: Select the time division or frequency division multiplexing techniques for transmitting multiple signals at a time in the communication system.
- CO 5: Examine the digital modulation techniques for convey more information, high quality and security
- CO 6: Choose appropriate techniques for signal processing and filtering in communication systems.

IV. COURSE CONTENT:

EXERCISE -1: Getting Started Exercises

Verification of Communication is the process of establishing connection or link between two points for information exchange.

EXERCISE -2: Exercises on Analog Modulation Techniques

Design of amplitude modulation (AM) systems -AM, DSBSC,

EXERCISE -3: Exercises on Angle Modulation Techniques

Calculation of Frequency Deviation and modulation index in Frequency Modulation (FM).-PM,

EXERCISE -4: Exercises on Analog Pulse Modulation

Techniques Verification of Analog Pulse Modulation Techniques - PAM, PWM, PPM.

EXERCISE -5: Exercises on Digital Pulse Modulation

Techniques Verification of Digital Pulse Modulation Techniques - PCM, DM

EXERCISE -6: Exercises on Digital Modulation Techniques

Verification of Digital Modulation Techniques -ASK, PSK, FSK,

EXERCISE -7: Exercises on Signal Processing in Communication Systems

Implement: Spectrum of the impulse train, pseudorandom sequence

EXERCISE -8: Exercises on Signal filtering

Implement the filtering of signals

EXERCISE -9: Exercises on Wireless Communication Systems

Implement: Okumura model, Multipath fading.

EXERCISE -10: Exercises on Data transmission

Implement: Spread spectrum modulation, Scrambler

EXERCISE -11: Exercises on Multiplexing

Implement the Multiplexing like frequency division, time division multiplexing

EXERCISE -12: Exercises on Generation of Noises

Obtain the hands- on experience on generation of noises.

EXERCISE -13: Exercises on generation and detection of DPSK

Verification of Digital Modulation Technique DPSK

EXERCISE -14: Exercises on case study: PLL

Generate FSK modulated signal using PLL

V. TEXTBOOKS:

1. J.G. Proakis, Digital Communications, McGraw-Hill, 5th edition,2006.
2. B.P. Lathi, "Modern Analog and Digital Communication" ,Oxford reprint,3rdedition,2004.

VI. REFERENCEBOOKS:

3. Wayne Tomasi, "ElectronicsCommunicationSystems-Fundamentals"5thedition,2009.

VII. ELECTRONICSRESOURCES:

4. <https://archive.org/details/analogcommunications>
5. <https://archive.org/details/digitalcommunications>

II. MATERIALS ONLINE

1. Course Outline Description
2. Lab Manual