INSTITUTE OF AERONAUTICAL ENGINEERING

Dundigal, Hyderabad - 500 043

ELECTRONICS AND COMMUNICATIONS ENGINEERING

COURSE DESCRIPTION FORM

Course Title	**ANALOG COMMUNICATIONS LAB**			
Course Code	**A50487**			
Regulation	**R13 - JNTUH**			
Course Structure	Lectures	Tutorials	Practicals	Credits
	-	-	3	2
Course Coordinator	Mr. G Laxminarayana, Assistant Professor, ECE			
Team of Instructors	Mr. G Laxminarayana, Assistant Professor, ECE Ms G Ajitha, Assistant Professor, ECE Ms. S Ranjitha, Assistant Professor, ECE Mr. V Naresh Kumar, Assistant Professor, ECE			

I. COURSE OVERVIEW:

This course provides practical hands on exposure to communication system building blocks. The objective of this lab is to teach students Amplitude and Frequency modulation. Generation and detection of AM, DSB-SC, SSB and FM signals. Time-division multiplexing systems, Frequency-division multiplexing systems. Sampling theory. Pulse modulation.

II. PREREQUISITE(S):

Level	Credits	Periods/ Week	Prerequisites
UG	2	3	Signals and Systems

III. MARKS DISTRIBUTION:

Sessional Marks	End Semester Exam	Total Marks
There shall be a continuous evaluation during the semester for 25 marks. Day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination conducted by the concerned teacher shall be evaluated for 10 marks.	50	75

IV. EVALUATION SCHEME:

S. No	Component	Duration	Marks
1.	Day-to-day Evaluation	-	15
2.	Internal Practical Examination	2.5 hours	10
5.	End Semester Examination	2.5 hours	50

V. COURSE OBJECTIVES:

At the end of the course, the students will be able to:

I. Analyze and specify the fundamental parameters of a communication system.

II. Evaluate the advantages and disadvantages of communications systems, from the point of view analog modulations.

III. To strengthen the ability to identify and apply the suitable modulation techniques for the given real world problem.

IV. To gain knowledge in practical applications of communication systems.

V. To write and execute programs in MATLAB to implement various modulation techniques.

VI. COURSE OUTCOMES:

After completing this course the student must demonstrate the knowledge and ability to:

1. Demonstrate understanding of various amplitude modulation and demodulation techniques.
2. Demonstrate understanding of frequency modulation and demodulation technique.
3. Explain the Sampling Theorem.
4. Explain the basic multiplexing techniques: FDM, TDM.
5. Understand and explain the AGC Characteristics.
6. Compare different modulations and to recognize the advantages and disadvantages of them.
7. Write programs using MATLAB.

VII. COURSE PLAN:

List of Experiments
Week -1 To generate amplitude modulated wave and determine the percentage modulation. Write a MATLAB program to implement Amplitude Modulation.
Week -2 To generate AM-Double Side Band Suppressed Carrier (DSB-SC) signal using Balanced Modulator. Write a MATLAB program to implement DSB-SC modulation
Week – 3 To generate the SSB modulated wave using Phase shift method and demodulate the SSB Modulated wave. Write a MATLAB program to implement SSB modulated wave.
Week – 4 To generate frequency modulated signal and determine the modulation index and bandwidth for various values of amplitude and frequency of modulating signal. Write a MATLAB program to implement FM modulation
Week – 5 To observe the effects of pre-emphasis and de-emphasis on given input signal. Write a MATLAB program for pre-emphasis and de-emphasis.
Week – 6 To study the operation of Time-Division multiplexing. Write a MATLAB program to implement TDM.
Week -7 To construct the frequency division multiplexing and demultiplexing circuit and to verify its operation. Write a MATLAB program for FDM.

Week -8 To study and verify the sampling theorem and reconstruction of sampled wave form. Write MATLAB program for sampling theorem.
Week -9 To study the operation pulse amplitude modulation and demodulation. Write a MATLAB program to implement PAM.
Week – 10 To study the operation of Pulse Width Modulation. Write a MATLAB program to implement PWM.
Week – 11 To study the operation of Pulse Position Modulation. Write a MATLAB program for implementing PPM.
Week – 12 To study the AGC Characteristics. Write MATLAB program for the AGC Characteristics.

Prepared by **:** Mr. G Laxminarayana, Assistant Professor, ECE
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