VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Modulation Theory and Techniques

(General Pool: Open Elective - II)

SYLLABUS FOR B.E. IV – SEMESTER (CSE, CSE(AI&ML) & IT branches)

L:T:P (Hrs./week): 3:0:0	SEE Marks: 60	Course Code: **U24OE420EC**
Credits: 3	CIE Marks: 40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To Analyze different analog modulation techniques such as AM, DSB-SC, SSB, and VSB. 2. To explore Angle modulation and demodulation techniques. 3. To comprehend sampling and pulse modulation techniques. 4. To investigate digital transmission methods including ASK, FSK, and BPSK. 5. To Understand Information Theory and Source Coding.	On completion of the course, students will be able to 1. Analyze the power and transmission bandwidth of Amplitude and FrequencyModulated signals. 2. Familiarize the process of reproduction of base band signal. 3. Analyze various pulse analog and pulse digital ModulationTechniques. 4. Understand the transmission of binary data in communication systems. 5. Estimate information content in a system

CO-PO-PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2			2									3	
CO2	3	2			2									3	
CO3	3	2			2									3	
CO4	2	2			2									3	
CO5	2	3			2									3	

UNIT - I

Amplitude Modulation: Introduction to Modulation, Need for Modulation, Modulation index, Side bands, AM Power, Double Side Band Suppressed Carrier Modulation, Single Side Band Modulation, Vestigial Side Band Modulation, AM demodulation, Frequency Division Multiplexing,

Lab Activity: Generation of AM using MATLAB and Simulink.

UNIT - II

Angle Modulation: Angle Modulation fundamentals, Frequency Modulation – Modulation index and sidebands, Narrowband FM, Wideband FM, Principles of Phase Modulation, FM demodulation

Lab Activity: Generation of FM signals using MATLAB and Simulink.

UNIT - III

Signal Sampling and Analog Pulse Communication: Ideal Sampling, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation.

Digital Communication Techniques: Quantization, Data Conversion, Time Division Multiplexing, Pulse Code Modulation, Delta Modulation.

Lab Activity: Demonstration of Sampling using MATLAB.

UNIT - IV

Transmission of Binary Data in Communication Systems: Digital Codes, Principles of Digital Transmission, ASK FSK, BPSK

Lab activity: Demonstration of ASK and BPSK using SIMULINK.

UNIT - V

Information Theory: Uncertainty, Information and entropy. Discrete memory less channels

Source Coding Techniques: Shannon-Fano coding, Huffman Coding

Lab activity: Entropy calculations using MATLAB

Learning Resources:

1. Louis E. Frenzel, Principles of Electronic Communication Systems, 3rdEdition. Tata Mcgraw Hill.
2. Wayne Tomasi, Electronic Communications Systems, 5th Edition,Pearson Education.

The break-up of CIE : Internal Tests + Assignments + Quizzes

1. No. of Internal Tests : 2 Max. Marks for each Internal Tests : 30
2. No. of Assignments : 3 Max. Marks for each Assignment : 5
3. No. of Quizzes : 3 Max. Marks for each Quiz Test : 5

Duration of Internal Tests: 90 Minutes