

EC 2311 COMMUNICATION ENGINEERING

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1. ANALOG COMMUNICATION

AM – Frequency spectrum – vector representation – power relations – generation of AM – DSB, DSB/SC, SSB, VSB AM Transmitter & Receiver; FM and PM – frequency spectrum – power relations : NBFM & WBFM, Generation of FM and DM, Amstrong method & Reactance modulations : FM & PM frequency.

2. DIGITAL COMMUNICATION

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Pulse modulations – concepts of sampling and sampling theormes, PAM, PWM, PPM, PTM, quantization and coding : DCM, DM, slope overload error. ADM, DPCM, OOK systems – ASK, FSK, PSK, BSK, QPSK, QAM, MSK, GMSK, applications of Data communication.

3. SOURCE CODES, LINE CODES & ERROR CONTROL (Qualitative only)

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Primary communication – entropy, properties, BSC, BEC, source coding : Shaum, Fao, Huffman coding : noiseless coding theorem, BW – SNR trade off codes: NRZ, RZ, AMI, HDBP, ABQ, MBnB codes : Efficiency of transmissions, error control codes and applications: convolutions & block codes.

4. MULTIPLE ACCESS TECHNIQUES

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SS&MA techniques : FDMA, TDMA, CDMA, SDMA application in wire and wireless communication : Advantages (merits) :

5. SATELLITE, OPTICAL FIBER – POWER LINE, SCADA

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Orbits : types of satellites : frequency used link establishment, MA techniques used in satellite communication, earth station; aperture actuators used in satellite – Intelsat and Insat: fibers – types: sources, detectors used, digital filters, optical link: power line carrier communications: SCADA

TOTAL : 45 PERIODS

TEXT BOOKS

1.Taub & Schiling “Principles of communication systems” Tata McGraw hill 2007

2.J.Das “Principles of digital communication” New Age International, 1986

REFERENCES

1. Kennedy and Davis "Electronic communication systems" Tata McGraw hill, 4th edition, 1993.
2. Sklar "Digital communication fundamentals and applications" Pearson Education, 2001
3. Bary le, Memuschmidt, digital Communication, Kluwer Publication, 2004.
4. B.P.Lathi "Modern digital and analog communication systems" Oxford University Press, 1998.

SUBJECT DESCRIPTION AND OBJECTIVES

DESCRIPTION:

Communications engineering is an engineering discipline that brings together electrical engineering with computer science to enhance communication systems. The work ranges from basic circuit design to strategic mass developments. A communication engineer is responsible for designing and overseeing the installation of communications equipment and facilities, such as complex electronic switching systems, copper wire telephone facilities, and fiber optics. Communication engineering also overlaps heavily with broadcast engineering.

Communication is a diverse field of engineering which is connected to electronics, civil, structural, and electrical engineering. Ultimately, communication engineers are responsible for providing the method for customers to have telephone and high-speed data services. It helps people who are closely working in political and social fields, as well accounting and project management.

OBJECTIVES

- To introduce different methods of analog communication and their significance
- To introduce Digital Communication methods for high bit rate transmission
- To introduce the concepts of source and line coding techniques for enhancing rating of transmission of minimizing the errors in transmission.
- To introduce MAC used in communication systems for enhancing the number of users.
- To introduce various media for digital communication

MICRO LESSON PLAN

Week	Hours	LECTURE TOPICS	READING
UNIT I -ANALOG COMMUNICATION			
I	1	AM – Frequency spectrum – vector representation – power relations	T1
	2	generation of AM – DSB, DSB/SC	T1
	3	SSB,VSB	T1
	4	AM Transmitter & Receiver	T1
	5	FM and PM – frequency spectrum – power relations	T1
II	6	NBFM & WBFM	T1
	7	Generation of FM and PM	T1
	8	Amstrong Method and Reactance modulations	T1
	9	FM & PM frequency (AV Class)	T1
UNIT II -DIGITAL COMMUNICATION			
III	10.	Pulse modulations – concepts of sampling, sampling theorems	T1
	11.	PAM, PWM, PPM,PTM (AV Class)	T1
	12.	quantization and coding	T1
	13.	DCM, DM, slope overload error, ADM	T1
	14.	DPCM	T1
IV	15	OOK Systems	R3
	16	ASK, FSK	T1
	17	PSK, BSK, QPSK, QAM, MSK, GMSK	T1
	18	applications of Data communication	T1
UNIT III - SOURCE CODES, LINE CODES AND ERROR CONTROL (qualitative only)			
V	19	Primary communication – entropy, properties	T1
	20.	BSC, BEC	T1
	21.	source coding : Shaum, Fao	T1
	22.	Huffman coding : noiseless coding theorem (AV Class)	T1
	23.	BW – SNR trade off codes:	T1
VI	24.	NRZ, RZ,	T1
	25.	AMI, HDBP, ABQ, MBnB codes	R3
	26.	Efficiency of transmissions	T1
	27.	Error control codes and applications: convolutions & block codes.	T1

UNIT IV MULTIPLE ACCESS TECHNIQUES			
VII	28,29	SS& MA techniques	R3
	30,31	FDMA (AV Class)	R3
	32	TDMA	R3
VIII	33,34	CDMA	R3
	35	SDMA application in wire& Wireless communication	R3
	36	Advantages;(Merits)	R3
UNIT V- SATELLITE , OPTICAL FIBER- POWER LINE, SCADA			
IX	37	Orbits : types of satellites	T1
	38,39	frequency used link establishment, MA techniques used in satellite communication	T1
	40	Earth station; aperture actuators used in satellite	T1
	41	Intelsat and Insat: (AV Class)	R1
X	42,43	fibers Types: sources, detectors used, digital filters	R1
	44	Optical link:	R1
	45	Power line carrier communications: SCADA	R1

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