EC1301 COMMUNICATION THEORY 3 1 0 100

AIM

To study the various analog communication fundamentals viz., Amplitude modulation and demodulation, angle modulation and demodulation. Noise performance of various receivers and information theory with source coding theorem are also dealt.

OBJECTIVE

- To provide various Amplitude modulation and demodulation systems.
- To provide various Angle modulation and demodulation systems.
- To provide some depth analysis in noise performance of various receiver.
- To study some basic information theory with some channel coding theorem.

UNIT I AMPLITUDE MODULATIONS 9

Generation and demodulation of AM, DSB-SC, SSB-SC, VSB Signals, Filtering of sidebands, Comparison of Amplitude modulation systems, Frequency translation, Frequency Division multiplexing, AM transmitters – Superhetrodyne receiver, AM receiver.

UNIT II ANGLE MODULATION 9

Angle modulation, frequency modulation, Narrowband and wideband FM, transmission bandwidth of FM signals, Generation of FM signal – Direct FM – indirect FM, Demodulation of FM signals, FM stereo multiplexing, PLL – Nonlinear model and linear model of PLL, Non-linear effects in FM systems, FM Broadcast receivers, FM stereo receives.

UNIT III NOISE PERFORMANCE OF DSB, SSB RECEIVERS 9

Noise – Shot noise, thermal noise, White noise, Noise equivalent Bandwidth, Narrowband noise, Representation of Narrowband noise in terms of envelope and

phase components, Sinewave plus Narrowband Noise, Receiver model, Noise in DSB-SC receiver, Noise in SSB receiver

UNIT IV NOISE PERFORMANCE OF AM AND FM RECEIVERS 9

Noise in AM receivers threshold effect, Noise in FM receivers capture effect, FM threshold effect, FM threshold reduction, Pre-emphasis and de-emphasis in FM, Comparison of performance of AM and FM systems.

UNIT V INFORMATION THEORY 9

Uncertainty, Information and entropy, Source coding theorem, Data compaction, Discrete memory less channels, mutual information, channel capacity, channel coding theorem, Differential entropy, and mutual information for continuous ensembles, information capacity theorem, implication of the information capacity theorem, rate distortion theory, Compression of information.

TUTORIAL 15

TOTAL : 60

TEXT BOOK

1. Simon Haykin, Communication Systems, John Wiley & sons, NY, 4th Edition, 2001.

REFERENCES

1. Roddy and Coolen, Electronic communication, PHI, New Delhi, 4th Edition, 2003.
2. Taub and Schilling, Principles of communication systems, TMH, New Delhi, 1995.
3. Bruce Carlson et al, Communication systems, McGraw-Hill Int., 4th Edition, 2002.