



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## SYLLABUS

II Year- IV Semester: B.Tech. (Information Technology)

### 4IT3-04: Principles of Communication

Credit: 3  
3L+0T+0P

Max. Marks: 150(IA:30, ETE:120)  
End Term Exam: 3 Hours

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	<b>ANALOG MODULATION:</b> Concept of frequency translation. Amplitude Modulation: Description of full AM, DSBSC, SSB and VSB in time and frequency domains, methods of generation & demodulation, frequency division multiplexing (FDM). Angle Modulation: Phase and frequency modulation. Descriptions of FM signal in time and frequency domains, methods of generation & demodulation, pre-emphasis & de-emphasis, PLL.	7
3	<b>PULSE ANALOG MODULATION:</b> Ideal sampling, Sampling theorem, aliasing, interpolation, natural and flat top sampling in time and frequency domains. Introduction to PAM, PWM, PPM modulation schemes. Time division multiplexing (TDM)	8
4	<b>PCM &amp; DELTA MODULATION SYSTEMS:</b> Uniform and Non-uniform quantization. PCM and delta modulation, Signal to quantization noise ratio in PCM and delta modulation. DPCM, ADM, T1 Carrier System, Matched filter detection. Error probability in PCM system.	8
5	<b>DIGITAL MODULATION:</b> Baseband transmission: Line coding (RZ, NRZ), inter symbol interference (ISI), pulse shaping, Nyquist criterion for distortion free base band transmission, raised cosine spectrum. Pass band transmission: Geometric interpretation of signals, orthogonalization. ASK PSK, FSK, QPSK and MSK modulation techniques, coherent detection and calculation of error probabilities.	8
6	<b>SPREAD-SPECTRUM MODULATION:</b> Introduction, Pseudo-Noise sequences, direct sequence spread spectrum (DSSS) with coherent BPSK, processing gain, probability of error, frequency-hop spread spectrum (FHSS). Application of spread spectrum: CDMA.	8
<b>Total</b>		<b>40</b>

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