भारतीय प्रौद्योगिकी संस्थान तिरुपति
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Syllabus for M.S.(R) & Ph.D. Written test/ Interview – January 2026 semester

Department of Electrical Engineering - Next Generation Wireless Communication and Networks

Linear Algebra, Probability & Random Variables: Matrix algebra, systems of linear equations, vector spaces, rank of a matrix, Eigenvalues and Eigenvectors, random variables, discrete and continuous distributions, normal and binomial distribution, correlation and independence, transformation of random variables, expectation and variance of random variables, conditional probability and distributions, random processes.

Signals and Systems: Continuous-time and discrete-time Fourier series, continuous-time and discrete-time Fourier Transform, DFT, sampling theorem, Linear Time-Invariant (LTI) Systems, causality, stability, impulse response, convolution, poles and zeros, frequency response.

Communications: Autocorrelation and power spectral density, properties of white noise, filtering of random signals through LTI systems, entropy and mutual information, digital modulation schemes, ASK, FSK, BPSK, QPSK, error probability.

Reference Books

[1] Gilbert Strang, Linear Algebra and its applications, Cengage Learning India; 4th edition.
[2] R. Sheldon, A first course in probability. Pearson Education India, 2002.
[3] A. V. Oppenheim and A. S. Willsky, Signals and Systems, Pearson Education, 2013.
[4] A. V. Oppenheim, R. W. Schafer and J. R. Buck, Discrete Signal Processing, Prentice-Hall Inc., 2009.
[5] Proakis, J. G.. Digital Communications, McGraw-Hill, 2008.