



Course: M. Tech Electronics & Communication	Name of Faculty: Arun A. Balakrishnan
Topic: 18-437-0103 - Digital Communication	Semester: I
Lecture Hall: Room No. 118	Timings: as per CBCS, slot B

Week and date	Lecture topics	Assignments	Remarks
Week 1 (8 th July 19)	Review of Probability		
Week 2 (15 th July 19)	Review of Random Variables		
Week 3 (22 nd July 19)	Moment generating function, Chernoff bound, Markov's inequality, Chebyshev's inequality, Central limit Theorem		
Week 4 (29 th July 19)	Chi square, Rayleigh and Rician distributions, Correlation, Covariance matrix- Stationary processes, wide sense stationary processes, ergodic process, cross correlation and autocorrelation functions-Gaussian process		
Week 5 (5 th Aug 19)	Signal space representation- Connecting Linear Vector Space to Physical Waveform Space- Scalar and Vector Communication over Memory less Channels	<i>Assignment-1</i>	
Week 6 (12 th Aug 19)	<i>First Internals</i>		
Week 7 (19 th Aug 19)	Optimum waveform receiver in additive white Gaussian noise (AWGN) channels - Cross correlation receiver, Matched filter receiver and error probabilities.	<i>Assignment-1 submission</i>	
Week 8 (26 th Aug 19)	Signals with random phase in AWGN Channels- Optimum receiver for Binary Signals- Optimum receiver for M-ary orthogonal signals- Probability of error for envelope detection of M-ary Orthogonal signals		
Week 9 (2 nd Sep 19)	Optimum waveform receiver for coloured Gaussian noise channels- KarhunenLoeve expansion approach, whitening	<i>Assignment-2</i>	
<i>Onam Vacation</i>			
Week 10 (17 th Sep 19)	Carrier Phase Estimation- Effect of additive noise on the phase estimate- Maximum Likelihood phase estimation- Symbol Timing Estimation		
Week 11 (23 rd Sep 19)	Maximum Likelihood timing estimation- Receiver structure with phase and timing recovery		
Week 12 (30 th Sep 19)	Joint Estimation of Carrier phase and Symbol Timing- Frequency offset estimation and tracking	<i>Assignment-2 submission</i>	
Week 13 (10 th Oct 19)	Optimum pulse shaping- Nyquist criterion for zero ISI, partial response signaling		
Week 14 (15 th Oct 19)	Equalization Techniques- Zero forcing linear Equalization- Decision feedback equalization		
Week 15 (21 st Oct 19)	Adaptive Equalization		
Week 16 (28 th Oct 19)	<i>Second Internals</i>		
Week 17 (5 th Nov 19)	<i>Publication of Sessional</i>		