

ESE 306: Random Signals and Systems

Spring 2011

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Teaching Assistant:	TBD	
Class Meetings:	TBD	
Recitation Meetings:	TBD	
Grading:	Best two out of three tests (each test 20%): 40% Graded quizzes: 20% Final exam: 40%	
Textbooks:	R. D. Yates and D. J. Goodman, <i>Probability and Stochastic Processes</i> , John Wiley and Sons, Inc, 2005	
Topics:	<p>Basic concepts of probability: probability axioms; conditional probability; independence; Bayes theorem</p> <p>Discrete random variables: definition; probability mass and cumulative distribution functions; functions of one random variable; uniform, Bernoulli, Poisson, geometric, and binomial random variables; moments of random variables</p> <p>Continuous random variables: definition, probability density and cumulative distribution functions, expected values; uniform, exponential, Gaussian random variables; mixed random variables; functions of one random variable; moments of random variables</p> <p>Pairs of random variables: joint cumulative distribution function; joint probability mass functions; joint probability density function; marginalization; conditional probability mass functions; conditional probability density function; independent random variables</p> <p>Random vectors: models of N random variables; marginal probability density functions; functions of random vectors; correlation matrices; independent random variables; Gaussian random vectors</p> <p>Stochastic processes: types of processes; independent and identically distributed random sequences; the Poisson process; the Brownian motion process; autocovariance and autocorrelation; stationarity, Gaussian processes</p> <p>Random signal processing: linear filtering; power spectral density; cross spectral density, digital signal processing,</p> <p>Statistical inference: hypothesis testing; basic concepts in estimation theory; minimum mean square and linear mean square estimation; maximum a posteriori and maximum likelihood estimation; properties of estimators</p>	