

Course Name:	ECE 30200 Probabilistic Methods in Electrical Engineering
Credit and contact hours:	(3 cr.) Class 3
Course coordinator's name	Paul Salama
Textbook	R. Yates and D. J. Goodman, <i>Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers</i> , 3th Edition, Wiley, 2013, ISBN No. 9781118324561.
Course Information	<p>ECE 30200 Probabilistic Methods in Electrical and Computer Engineering (3 cr.) P: or C: ECE 30100. Class 3. An introductory treatment of probability theory, including distribution and density functions, moments, and random variables. Applications of normal and exponential distributions. Estimation of means and variances. Introduction to random processes, correlation functions, spectral density functions, and response of linear systems to random inputs.</p> <p>Prerequisites/ CoRequisite C: ECE 301</p> <p>Indicate whether a required, elective, or selected elective course in the program</p>
Goals for the course	<p>Upon successful completion of the course, students should be able to</p> <ol style="list-style-type: none"> 1. Solve simple probability problems in electrical and computer engineering applications. [1] 2. Model complex families of signals by means of random processes. [2,6] 3. Determine the random process model for the output of a linear system when the system and input random process models are known. [1,2,6]
List of topics to be covered	<ol style="list-style-type: none"> 1. Introduction, relative-frequency approach, set theory (2 classes) 2. Axiomatic approach, conditional probability, independence (3 classes) 3. Bernoulli trials, random variables and distribution functions, probability density functions (3 classes) 4. Mean values and moments, Gaussian random variables and their related density functions (2 classes) 5. Other density functions, conditional density functions (3 classes) 6. Applications, joint distributions (3 classes) 7. Conditional probability, independence, covariance, sums of random variables (2 classes) 8. Random process definitions, examples of random processes (3 classes)

	9. Correlation functions, properties of correlation functions, measurement of correlation functions (3 classes) 10. Cross-correlation functions, applications (2 classes) 11. Spectral density, properties of spectral density, mean-square values from spectral density (3 classes) 12. Review and exams (3 classes)
Syllabi Approved by	Paul Salama
Date of Approval	11/12/2021