

**Department of Computer Science and Electrical Engineering  
University of Maryland, Baltimore County**

**CMPE 320 Probability, Statistics, and Random Processes**

**Spring 2018**

**Course description:** This course presents the fundamental concepts of probability, statistics and random processes from a computer and electrical engineering prospective, emphasizing applications in communications and signal processing. Students will learn the basics to analyze and model the probabilistic behavior of engineering systems and to analyze experimental data associated with such systems.

**Prerequisites:** MATH 251, MATH 225

**Class meetings:** MoWe 4PM – 5:15PM, ITE 104

**Instructor:** Prof. Seung-Jun Kim, PhD, ITE 312, (410) 455-3372, sjkim@umbc.edu

**Instructor office hours:** Tu 1PM - 2PM, ITE 312

**Teaching Assistant:** Young-Hwan Lee, ITE 371, (410) 455-8644, lee43@umbc.edu

**TA office hours:** Th 1 PM – 2PM, ITE 371

**Required textbook**

D. P. Bertsekas, J. N. Tsitsiklis, Introduction to Probability, Second Edition, Athena Scientific, 2002.

**Helpful references**

H. Stark and J. W. Woods, Probability, Statistics, and Random Processes for Engineers, 4th Edition, Prentice Hall, 2012.

C. W. Therrien and M. Tummala, Probability and Random Processes for Electrical and Computer Engineers, 2<sup>nd</sup> Edition, CRC Press, 2012.

S. M. Kay, Intuitive Probability and Random Processes using MATLAB, Springer, 2006.

P. Z. Peebles, Jr., Probability, Random Variables, and Random Signal Principles, 4<sup>th</sup> Ed., McGraw-Hill, 2000.

**Grading:** Homework (20%); Midterms 1 & 2 (40%); Final (40%)

**Course topics and schedule**

Date	Topics	Note
Jan. 29	Introduction; Set operations (§1.1)	
Jan. 31	Probability models (§1.2)	
Feb. 5	Conditional probability (§1.3)	HW#1
Feb. 7	Total probability & Bayes theorem (§1.4)	
Feb. 12	Independence (§1.5)	HW#2
Feb. 14	Counting (§1.6)	
Feb. 19	Random variable (RV) (§2.1)	HW#3
Feb. 21	Probability mass function (PMF) (§2.2)	
Feb. 26	Functions of RVs, Expectation (§§2.3-2.4)	HW#4
Feb. 28	Expectation, mean, variance (§2.4)	
Mar. 5	Review	
Mar. 7	Midterm 1	
Mar. 12	Joint PMFs of multiple RVs (§2.5)	
Mar. 14	Conditioning (§2.6)	HW#5
Mar. 19	SPRING BREAK	
Mar. 21	SPRING BREAK	
Mar. 26	Independence (§2.7)	
Mar. 28	Continuous RVs and PDFs (§3.1)	
Apr. 2	Cumulative distribution functions (§3.2)	HW#6
Apr. 4	Normal RV (§3.3)	
Apr. 9	Joint PDFs of multiple RVs (§3.4)	HW#7
Apr. 11	Conditioning (§3.5)	
Apr. 16	Review	
Apr. 18	Midterm 2	
Apr. 23	Continuous Bayes' rule (§3.6)	
Apr. 25	Derived distributions (§4.1)	HW#8
Apr. 30	Sums of independent RVs (§4.1)	
May 2	Covariance and correlation (§4.2)	HW#9
May 7	Conditional expectation and variance revisited (§4.3)	
May 9	Transforms (§4.4)	
May 14	Review	

**Academic Honesty**

By enrolling in ENEE 621, each student assumes the responsibilities of an active participant in UMBC's scholarly community, in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. The full Student Academic Conduct Policy is available in the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory.