

STAT 4843 - Theory of Probability

Fall 2026 Syllabus, Section 01, CRN 43606,

Credit hours: 3

Instructor

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Public Instructor Information

Instructor Title: Professor

Instructor Professional Qualifications: Ph. D., Mathematics, Bowling Green State University, 2006

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Course Description

4843. Theory of Probability. The mathematical foundation of probability theory including the study of discrete and continuous distributions. Other topics selected from limit theorems, generating functions, stochastic processes, and applications. Prereq.: STAT 3743 and one of MATH 2673 or MATH 2686H or consent of department chairperson. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Statistical Inference (2nd Edition)	George Casella and Roger L. Berger.	978-0534243128

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Week of	Reading(s)	Proposed Topic	Due/To Prepare for Class
8/24	Section 1.1 Set Theory	Sample space, events, set operations, basic laws of set theory, partition of sample space	
8/31	Section 1.2 Basics of Probability Theory	Sigma-algebra, probability function, counting techniques	Quiz 1
9/7	Section 1.3 Conditional Probability and Independence	Conditional probability, independent events, Bayes' rule	Quiz 2
9/14	Section 1.4 Random Variables and Distributions	Random variables, cumulative distribution function, density and mass function	Quiz 3
9/21	Section 2.1 Distributions of Functions of a Random Variable	Distributions of functions of discrete and continuous random variables	Exam 1
9/28	Section 2.2 Expected Values	Definition and properties of expectations	Quiz 4
10/5	Section 2.3 Moments and Moment Generating Functions	Definition and properties of moments and moment generating functions	Quiz 5 and Exam 2
10/12	Section 3.1 Discrete Distributions	Uniform, Hypergeometric, and Binomial distributions	Quiz 6
10/19	Section 3.1 Discrete Distributions	Poisson, Negative Binomial, and Geometric distributions	
10/26	Section 3.2 Continuous Distributions	Uniform, Normal and Gamma distributions	Quiz 7
11/2	Section 3.2 Continuous Distributions	Exponential and Beta Distributions	Exam 3

11/9	Section 4.1 Joint and Marginal Distributions	Joint and marginal probability mass function, joint and marginal probability density function	Quiz 8
11/16	Section 4.2 Conditional Distributions and Independence	Conditional distribution and independence of two random variables	Quiz 9
11/23	Section 4.3 Bivariate Transformation	One-to-One and Two-to-One bivariate transformations	Quiz 10
11/30	Section 4.4 Hierarchical Models and Mixture Distributions; Section 4.5 Covariance and Correlation	Hierarchical models, definition and properties of covariance and correlation	
12/7	Finals Week		Final Exam

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