STAT 6943 - Mathematical Statistics 1

Fall 2026 Syllabus, Section 01, CRN 43607,

Credit hours: 3

Instructor

Lucy Kerns

Email: xlu@ysu.edu

Public Instructor Information

Instructor Title: Professor
Instructor Professional Qualifications: Ph. D., Mathematics, Bowling Green State University, 2006
Instructor Office Location: Cafaro Hall Room 641
Instructor Office Phone: 330-941-1412

Course Description

6943. Mathematical Statistics 1. Random variables, their distributions and densities. Families and exponential families of distribution. Independence, joint distributions, conditional probability and expectation. Convergence and limit theorems. Credit will not be given for both STAT 4843 and STAT 6943. Prereq.: MATH 3751 or MATH 5851 or permission of graduate coordinator. 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	Defintion 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 Bionomial, 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, defintion and properties of covariance and correlation	
12/7	Finals Week		Final Exam

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.