

Tennessee Tech University
Mathematics Department
MATH 5470-Section 001
3 Credit Hours, Fall 2026

Instructor Information

Name: Motoya Machida

Office: Bruner Hall 338

Office Hours: Monday, Wednesday and Friday, 8:00-8:50am, and Tuesday and Thursday, 8:00-9:50am. An appointment at different time can be arranged in person, or via Zoom.

Email: mmachida@tnitech.edu

Phone: (931) 372-3583

Course Information

Course Name

Probability & Statistics I

Meeting Days, Times and Location

MWF 9:00-9:50 a.m. at Bruner Hall 115

Pre-requisites

C or better in MATH 2110 or consent of instructor.

Course Description

This course provides a strong foundation in mathematics of probability and random phenomena.

Course Objectives

At their successful completion of the course students will be able to

- (a) understand basic concepts of probability theory;
- (b) manipulate frequency functions, density functions, and cumulative distributions;
- (c) calculate probability of an event and expectation and variance of a random variable;
- (d) use conditional expectations to find the best prediction.

Furthermore, the course will help students to develop the skills to read professional research articles involving probabilistic approach and/or statistical methods.

Resources

Required Texts

Introduction to Mathematical Statistics, 8th ed. Prentice Hall, by Robert V. Hogg, Joseph W. McKean, and Allen T. Craig.

Topics to be covered

We begin with the basic concepts of probability, such as events, random variables, independence, and conditional probability. Having developed these concepts, the remainder of the course concentrates on the methods of calculation in probability and their applications through exercises. The topics treated here are divided into the five major parts:

1. probabilistic models;
2. random variables;
3. discrete distributions;
4. continuous distributions;
5. joint distributions.

When completed, these topics will unify the understanding of density and distribution functions of various kinds, calculation and interpretation of moments, and distributions related to normal distributions.

Instructional Platform

- e-math/MCMC/page2 (<https://vps63.heliohost.us/e-math/MCMC/page2.html>)

Course Structure

Student Learning Outcomes

Upon successful completion of the course students will understand the fundamental principles of probability theory and statistical reasoning; gain problem-solving skills in calculating probability and expectation of random variables in various distributions; acquire skills in probabilistic approach, descriptive statistics, and exploratory graphics; and utilize appropriate methodology to create probabilistic models as a supporting skill for probability theory and data-oriented analysis.

Major Teaching Methods

Lectures and assignments will be substantial course portfolios. Each homework assignment must be completed individually and organized well for your own future reference. Then quiz will be given to follow up your work, and cover the class material and homework assignment from the previous topics. Thus, *it is very important to complete the homework assignment before quiz.*

Quizzes and Tests

Quizzes and tests will be announced in class and at the Canvas.

Final Exam

Final exam is scheduled on Tuesday, 8:00 - 10:00, December 8.

Grading Criteria and Evaluation Procedures

The final grade is determined as follows:

Optional Homework	10%
Quizzes	20%
Test 1	20%
Test 2	20%
Final Exam	30%

This is the grading scheme for the course:

Scaled Score	Letter Equivalent
90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
Below 59%	F

Course Policies

Attendance Policy

Students must send me a brief e-mail to explain their absence in advance. I will occasionally prepare the attendance sheet to sign when you come to the class. Students who repeatedly arrive late to the lecture may have their overall evaluation lowered.

Generative AI Policy

In this course Generative AI resources are not permitted. Students are expected to do all work themselves. The use of a Generative AI Tool to complete quiz or test constitutes academic misconduct for this course.

Student Academic Integrity Policy

Maintaining high standards of academic integrity in every class is critical to the reputation of Tennessee Tech, its students, faculty, alumni, and the employers of Tennessee Tech graduates. Academic integrity is at the foundation of the educational process and the key to student success. Students with academic integrity are committed to honesty, ethical behavior, and avoiding violations of academic integrity. All students are required to read and understand Policy 216: Student Academic Integrity. Please see the Academic Integrity website (<https://www.tntech.edu/provost/academicintegrity/>) for more information.

Disability Accommodation

Students with a disability requiring accommodations should contact the Accessible Education Center (AEC). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The AEC is located in the Roaden University Center, Room 112; phone 931-372-6119. For details, view the Tennessee Tech's Policy 340 – [Services for Students with Disabilities at Policy Central](#).