



蘇州大學
Soochow University

STA 295 Probability and Statistics I

Winter 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course is an introductory course designed to provide students with a strong foundation in the fundamental concepts and techniques of probability and statistics. This course serves as the gateway to the world of statistical analysis, enabling students to understand and apply statistical methods to real-world problems in various fields such as science, engineering, business, social sciences, and more. Modules include random experiments, probabilities, random variables, expected values, independent events and more.

Upon Completion of this Course, students will be able to:

1. Understand the principles of probability, including basic probability rules, random variables, and probability distribution;
2. Develop skills in organizing and analyzing data, including data collection, summarization, and graphical representation;
3. Explore descriptive statistics, including measures of central tendency and variability, and their interpretation;
4. Learn about sampling techniques, sampling distributions, and the central limit theorem;
5. Develop critical thinking skills by applying statistical methods to real-world problems and making informed decisions based on data analysis.

PREREQUISITES

MAT 166 Differential and Integral Calculus



GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
3 Quizzes	15 Points
2 Assignments	20 Points
Midterm	15 Points
Final Project	20 Points
Final Exam	30 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

1. David F. Anderson; Timo Seppäläinen; Benedek Valkó, *Introduction to Probability*, 1st Edition, Cambridge University Press, 2018.
2. William Mendenhall; Robert J. Beaver; Barbara M. Beaver, *Introduction to Probability and Statistics*, 15th Edition, Cengage Learning, 2020.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
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Module 1	Topics: Topic 1: Random sampling Topic 2: Probability distributions of random variables Topic 3: Experiments with random outcomes Topic 4: Sample spaces and probabilities Assessments: Quiz#1
Module 2	Topics: Topic 5: Joint distribution of random variables Topic 6: Joint distributions and independence Topic 7: Conditional distribution of a discrete random variable Topic 8: Conditional expectation Assessments: Quiz#2 Assignment#1
Module 3	Topics: Topic 9: Moment generating function Topic 10: Sums and moment generating functions Topic 11: Calculating the p-Value Topic 12: Events and the Sample Space Assessments: Midterm Assignment#2
Module 4	Topics: Topic 13: Calculating Probabilities Using Simple Events Topic 14: Tail bounds and limit theorems Topic 15: Law of large numbers Topic 16: Central limit theorem Assessments: Quiz#3
Module 5	Topics: Topic 17: Monte Carlo method Topic 18: A Comparison of Statistical Tests Topic 19: The Wilcoxon Signed-Rank Test for a Paired Experiment Topic 20: Rank Correlation Coefficient Assessments: Final Project and Exam

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to



decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the



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academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.