STA 297 Probability and Statistics

Summer 2024

Course Credits: 4
Contact Hours: 56 hours
Instructor: TBA
Email:TBA

COURSE OBJECTIVES

The aim of the course is to introduce students to the theory of probability and some of the statistical methods based upon it. Many physical processes involve random components which can only be modelled using probabilistic methods. Statistical theory is vital for analyzing scientific data where it is necessary to distinguish genuine patterns from random fluctuations.

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

1. Develop a solid foundation in probability theory, including concepts such as sample spaces, events, random variables, probability distributions, and probability laws.

2. Apply different probability models and distributions to real-world situations and understand the characteristics and properties of commonly used distributions, such as the binomial, normal, and exponential distributions.

3. Acquire skills in designing and conducting statistical experiments and studies and learn to formulate research questions, design sampling plans, and collect data using appropriate methods.

4. Apply probability and statistics to make informed decisions in various fields, including business, engineering, social sciences, and healthcare.

5. Be equipped with the skills to analyze and interpret data-driven insights for effective decision-making.

PREREQUISITES

STA 201 Statistics

GRADING

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

ITEM	POINTS
Quizzes	20 Points
Midterm 1	20 Points
Midterm 2	20 Points
Final Exam	40 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:

Wackerley, Mendenhall and Scheaffer, ***Mathematical Statistics with Applications*** (6th edition), Duxbury Press.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	**Topics:** Topic 1: Sets and Set Notation. Topic 2: DeMorgan's Laws and Introduction to Venn Diagrams. Topic 3: Venn Diagrams and Counting Element. Topic 4: Tree Diagrams & the Multiplication Principle. **Assessments:** Quiz#1

Module 2	**Topics:** Topic 5: Factorials, Permutations, and Combinations. Topic 6: Counting Problems and Word Problem. Topic 7: Combinations and Binomial Expansion. Topic 8: Terminology of Probability. **Assessments:** Quiz#2
Module 3	**Topics:** Topic 9: Basic Probability Calculation. Topic 10: Conditional Probability and Independence. Topic 11: Discrete Probability Distributions. Topic 12: Mean, Variance, and Expectation. **Assessments:** Midterm#1
Module 4	**Topics:** Topic 13: Bayes' Theorem. Topic 14: The Normal Distribution. Topic 15: Properties of Normal Distribution. Topic 16: The Standard Normal Distribution. **Assessments:** Midterm#2
Module 5	**Topics:** Topic 17: The Central Limit Theorem. Topic 18: Binomial Trials. Topic 19: The Normal Approximation to the Binomial Distribution. Topic 20: Applications of the Normal Distribution. **Assessments:** Final 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).

ACEDEMIC INTEGRITY POLICY

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