STA 330 Intermediate Probability

Summer 2024

Course Credits: 4
Contact Hours: 55 hours
Instructor: TBA
Email:TBA

COURSE OBJECTIVES

This course covers advanced knowledge in probability. Which includes the probability set function, additional properties of probability, conditional probability and independence, random variables, discrete random variables, transformations, continuous random variables, conditional distributions and expectations, independent random variables, the correlation coefficient; marginal, binomial and related, negative binomial and geometric, multinomial, hypergeometric, poisson, Gamma, Chi-squared, Beta, normal, multivariate normal, T and F distributions and Student's theorem.

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

1. Understand fundamental concepts in probability
2. Explain theories behind different distributions
3. Calculate z test score and t test score
4. Apply normal distribution to simple statistical problems
5. Understand differences between CDF and PDF

PREREQUISITES

STA 202 Introduction to Probability

GRADING

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

ITEM	POINTS

2 Reports	20 Points
Midterm 1	15 Points
Midterm 2	15 Points
2 Essays	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:

Robert V. Hogg, Joseph W. McKean, Allen T. Craig, ***Introduction to Mathematical Statistics***, 8th Edition, Pearson, 2019.

Recommended (Optional) Texts or Other Materials:

Jay L. Devore, Kenneth N. Berk, ***Modern Mathematical Statistics with Applications***, 2nd Edition, Springer, 2018.

COURSE TOPICS

MODULE	TASKS
Module 1	**Topics:** Topic 1: The probability set function Topic 2: Additional properties of probability Topic 3: Conditional probability and independence Topic 4: Random variables **Assessments:** Report#1
Module 2	**Topics:** Topic 5: Discrete random variables Topic 6: Continuous random variables Topic 7: Marginal distributions Topic 8: Conditional distributions and expectations **Assessments:**

	Report#2 Essay#1
Module 3	**Topics:** Topic 9: The correlation coefficient Topic 10: The binomial and related distributions Topic 11: Negative binomial and geometric distributions Topic 12: Multinomial distribution **Assessments:** Midterm#1
Module 4	**Topics:** Topic 13: Hypergeometric distribution Topic 14: Poisson distribution Topic 15: Gamma distributions Topic 16: Chi-squared distribution **Assessments:** Midterm#2 Essay#2
Module 5	**Topics:** Topic 17: Beta distribution Topic 18: The normal distribution Topic 19: The multivariate normal distribution Topic 20: T-and F-distributions **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.