Soochow University

STA 230 Probability

Summer 2021

Course information

Course Credits: 4

Contact Hours: 55 hours

Class Time: 8:30 - 10:20

Instructor: TBA

Course Format: Online

Course Description

This course offers an introduction to the theory of probability and empirical skills to students with a background in mathematics, statistics, engineering or computer science. Topics of this course include conditional probabilities, random variables and binomial random variables, continuous random variables, distribution functions, expectation and conditional expectation, Chebyshev's inequality, the central limit theorem, the Poisson process and more. Students will develop mathematical techniques to calculate probabilities and make simple prediction by learning this

Prerequisite(s)

MAT 110 Calculus I or MAT 130 Linear Algebra.

Learning Objectives

Upon completion of this course, students will be able to:

1. Develop the understanding of probability theories and skills;
2. Calculate basic descriptive statistical data based on functions, distribution functions and more;
3. Compute the probabilities and expectations of simple and compound events;
4. Apply scientific statistical methods to analyze case studies and problem sets.

Methodology

Methodology	Hours	Hours of work During class	Hours of work After class
Online Video	50	88 hours (60%)	
Online Forum Discussion	8		
Assessment	30		
Personal study	30		68 hours (40%)
Tasks	22		
Practical teaching preparation	10		
Bibliographic search	6		
Total	**156**	**88**	**68**

Textbook(s)

Sheldon Ross. 2014. ***A First Course in Probability***, 9th edition. Pearson Education, Inc. Press.

Tasks and Evaluation

2 Assignments	20% (10% for each)
2 Quizzes	20% (10% for each)
Midterm Test	25%
Final Exam	35%

Students are required to attend online classes on the scheduled time. 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.

Online forum discussion is required. Students are required to post at least one question and answer at least one question on the forum weekly.

Online Tutorials are mandatory. Students will read and discuss academic articles provided. Students will also discuss the case studies for the week's lectures. Each Tutorial will be 1 hour.

All exams will be held online and the time of each exam will be limited to 1 hour. Exams must also be taken at the scheduled time. There will be no make-up exams

Rating system:

1. Assessment

ASSESSMENT ITEM	PERCENT OF FINAL GRADE
2 Assignments	20% (10% for each)
2 Quizzes	20% (10% for each)
Midterm	25%
Final exam	35%

2. Grading Scale

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	

Course Content

Week	Lesson	Content
1	1	Course Introduction The Basic Principle of Counting
	2	Sample Space and Events Probability as a Continuous Set Function
	3	Conditional Probabilities
	4	Bayes's Formula
	5	Independent Events; P(·|F) Is a Probability
2	6	Random Variables; Discrete Random Variables **Assignment 1 due**

	7	Expected Value; Expectation of a Function of a Random Variable
	8	Variance The Bernoulli and Binomial Random Variable
	9	The Poisson Random Variable **Quiz 1**
	10	Other Discrete Probability Distributions Expected Value of Sums of Random Variables
3	11	**Midterm Test**
	12	Expectation and Variance of Continuous Random Variables; Normal Random Variables
	13	Joint Distribution Functions
	14	Independent Random Variables
	15	Sums of Independent Random Variables **Assignment 2 due**
4	16	Joint Probability Distribution of Functions of Random Variables
	17	Joint Probability Distribution of Functions of Random Variables (Cont.)
	18	Expectation of Sums of Random Variables
	19	Chebyshev's Inequality and the Weak Law of Large Numbers
	20	The Central Limit Theorem
5	21	The Strong Law of Large Numbers
	22	The Poisson Process Markov Chains **Quiz 2**
	23	General Techniques for Simulating Continuous Random Variables
	24	Final Exam Reviews
	25	**Final Exam**

University Regulations and Services

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.

Soochow University also highly respects students' accommodation for disabilities and religions. You might contact the Student Accessibility Office if you have any questions, concerns or if you would like to report any offensive behaviors.

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.