STAT 1152: INTRODUCTION TO MATHEMATICAL STATISTICS

Spring 2025 Course Syllabus

Credits: 3

Lecture Hours

Section 1: Monday 8:15-11:00 am, S202
Section 2: Tuesday 8:15-11:00 am, S202

Instructor

Dr. Xiaomei Tan
Email: xiaomei.tan@scupi.cn
Office: N417, SCUPI Building
Office Hours: Wednesday 9 am -12 pm, 2-5 pm
Contact Instructor:
- Attend office hour or via email
- Extra office hours will be offered by appointment.

Teaching Assistants

Weijia Wang (Section 1)
Email: 735839579@qq.com

Bei Wu (Section 2)
Email: 2488455026@qq.com

TA Responsibilities: TAs primarily support the instructor across a range of tasks, including grading homework, recording attendance, addressing student inquires, and contributing to the smooth functioning of educational environments.
Contact TAs: QQ Group or via email

Note:
- Modifications to this syllabus may occur. Please stay informed about any revisions announced during class or on the Blackboard website. Lecture materials, reading lists, grading details, and announcements will all be accessible through Blackboard.
- Important dates and information will be announced during class. Students should stay informed about announcements on Blackboard and via emails sent to their SCU email address.
- While emailing the instructor or TAs, please kindly include **"STAT 1152"** in the subject line for efficient communication. Please use your university email account (student_ID_number@stu.scu.edu.cn), as emails from other sources could be caught by the SCU spam filter.

Textbook

Walpole R. E., Myers R. H., Myers S. L., & Ye K. (2012). *Probability & Statistics for Engineers & Scientists* (9th ed.). Prentice Hall. (Available on Blackboard)

Prerequisites

STAT 1151 or IE 1070 (Probability) and Calculus (Differentiation and Integration)

Course Description

This course is the continuation of *STAT 1151 Introduction to Probability* and provides students with a deeper understanding of statistical methods used in data analysis. This course covers key topics such as sampling distributions, point and interval estimation, hypothesis testing, regression analysis, and analysis of variance (ANOVA). Students will learn the principles and techniques for making inferences from data, understanding variability, and drawing conclusions from statistical evidence. The course emphasizes the application of statistical theory to real-world problems and prepares students for more advanced courses in statistics and data analysis.

Course Objectives

This course aims to equip students with the fundamental statistical tools needed to analyze and interpret data. Students will learn how to estimate population parameters, test hypotheses, and evaluate the relationships between variables using regression and ANOVA techniques. The course also aims to provide students with the skills necessary to apply statistical methods to a variety of fields, from social sciences to engineering, while reinforcing the understanding of underlying theoretical principles.

Learning Outcomes

Upon successful completion of this course, students will be able to:
- Formulate real-world scenarios into statistical problems using mathematical terms.
- Identify and apply suitable statistical methods for problem resolution.
- Understand the implications and limitations of different statistical methods.
- Develop skills in analytical reasoning and solving issues within statistical data analysis.

Grading

- In-class exercises and attendance: 10%
- Homework: 10%
- Midterm exams: 40%
- Final exam: 40%

Attendance

Attendance at lectures is mandatory. Missing three or more sessions will result in a loss of all the attendance points. Absences of five or more will lead to failure (F grade) in the course. To monitor attendance, in-class exercises will be conducted randomly. **NO makeup in-class exercises will be permitted.**

Homework

[Due] Homework assignments will be distributed periodically throughout the semester and will be due at the start of the subsequent class, usually due on 8:15 AM. L**ate homework will NOT be accepted**, unless certified medical proof is given. It is advised that assignments be submitted

in advance of the designated deadline to avoid any potential lateness. It is the students' responsibility to ensure accurate and timely submission.

[Submission] Each assignment must be submitted in **one PDF format file through the Blackboard**. Please answer the problems according to the order of problems assigned. (Notes: The homework can be typed or handwritten to take photos. The HW done on iPad can be directly generated by the software to generate PDF files, and the handwritten work can be merged to generate PDF as well.)

[Naming Format] Student ID Name. (Example: 2022141520173王唯佳)

[Grading Criteria] The full score of each assignment is 100 points. Five points will be lost if you fail to submit it in the correct format and order of the problems. Extra points will be lost if you miss answering problems. **Directly copying and pasting solutions generated by AI tools is prohibited and will result in a complete loss of points for that question.**

Exams

[Format] Exams are scheduled following the course timetable. **Closed book, closed notes. A single A4-sized cheat sheet is allowed** with content handwritten on both sides.

[Attendance] Attendance for exams is mandatory. In case of foreseeable absences, it is the students' responsibility to inform the instructor **one week prior to the event** and provide **written verification** of the reason for missing the event. For unforeseen emergencies, it is the students' responsibility to provide written verification **within one week after the event**. Makeup exams will be arranged as needed. Failure to give prior notice for an absence will result in a "**ZERO**" score, except in exceptional cases.

Class Policy

1. Class participation
Regular class attendance as well as active participation in course activities is expected. It is the students' responsibility to complete all assigned in-class tasks. Any required student absences should be reported to the instructor in advance via email or if not possible in advance, shortly thereafter.

2. Academic integrity
Students are expected to uphold academic integrity by completing all assignments and exams independently. **Any violations, including cheating, plagiarism, unauthorized collaboration, and uncredited use of generative AI tools for assignments, will result in severe consequences, including possible failure of the course.** Specific violations include:
- **Cheating**: Copying from others, using unauthorized materials, receiving or providing unauthorized help during exams, such as trading examinations, whispering answers, passing notes, or using electronic devices to transmit or receive information.
- **Plagiarism:** Presenting someone else's work, ideas, or data as your own without giving credit. Sources include published works such as book, movies, websites, and unpublished works such as other students' papers or material from a research service. The risk of plagiarism can be avoided in written work by clearly indicating, either in footnotes or in the paper itself, the source of any major or unique idea or wording that you did not arrive at on your own. Sources must be given regardless of whether the material is quoted directly or paraphrased.

- **Unauthorized Collaboration:** Working with others on assignments without instructor approval. If in doubt, seek permission from the instructor before working with others. Students are encouraged to learn from one another: form study groups, discuss assignments, BUT each assignment must be the student's individual work unless specified as a group task.
- **AI-Generated Content:** Students are permitted to use AI tools to assist with their coursework, provided the content is not directly copied and pasted without critical engagement. When using AI-generated material, students must thoroughly review, modify, and integrate the content into their own work, ensuring it aligns with course objectives and demonstrates their understanding of the subject matter. **All sources, including AI-generated content, must be properly cited to avoid plagiarism.** The purpose of AI tools is to assist in the learning process, not to replace individual thought and effort. **Directly copying and pasting AI-generated content without analysis will be considered academic misconduct and will result in a complete loss of points.**

3. Accommodation
Students requiring accommodations should schedule a meeting within the first week of classes.

Tentative Course Schedule (February 24, 2025)

Week	Mon	Tue	Topic	Chapter
1	2/24	2/25	Syllabus; Introduction (sampling, statistics, sampling distribution, central limit theorem)	1,8
2	3/3	3/4	Estimation of Mean	9
3	3/10	3/11	Estimation of Variance; Difference between Two Means	9
4	3/17	3/18	Estimation of Ratio of Two Variances; Maximum Likelihood	9
5	3/24	3/25	One- and Two-Sample Tests of Hypotheses	10
6	3/31	4/1	One- and Two-Sample Tests of Hypotheses	10
7	4/7	4/8	Goodness of Fit; Tests for Independence and Homogeneity; Review	10
8	TBD		Midterm Exam (No class)	
9	4/21	4/22	Simple Linear Regression	11
10	4/28	4/29	Simple Linear Regression	11
11	5/5	5/6	Correlation; Multiple Linear Regression	11, 12
12	5/12	5/13	Multiple Linear Regression	12
13	5/19	5/20	One-Factor Experiments	13
14	5/26	5/27	Multi-Factor Experiments	14
15	6/2	6/3	Nonparametric Statistics	16
16	6/9	6/10	Bayesian Statistics; Review	18
17	TBD		Final Exam (No class)	

Please Note: The schedule is subject to change based on the classroom driven and the interactive nature of this course. All topics will be covered, but order may vary. Changes to the schedule will be announced during the lecture period and updated in syllabus. Students are responsible for noting these changes.