STAT 345/834 Advanced Experimental Design 2026-2027 T2

Instructor:

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Course Details

STAT 345 CRN 22067
STAT 834 CRN 23114

Schedule:

Term 2
M, W, F 10:30 – 11:20 am
M 2:30 – 3:20 pm

Tentative Topics:

Some of the topics covered will include:

- Observational Studies vs Designed Experiments
- Experimental Designs for Effect Estimation
- Experimental Designs for Screening
- Experimental Designs for Optimization

Course Objective:

This course introduces students to the fundamental principles and methods of experimental design for scientific studies, engineering applications, and data-driven decision making. Students will learn how to design efficient experiments, analyze experimental data, and interpret results using statistical methods. The course also covers modern topics such as factorial designs, response surface methods, causal inference, and adaptive experimentation (if time permits). By the end of the course, students will be able to critically evaluate experimental studies and develop appropriate experimental strategies for real-world problems across diverse disciplines.

Students Who May Be Interested:

Undergraduate/Graduate students in Statistics, Data Science, Mathematics, Computer Science, Engineering, Biomedical sciences, Social sciences, Business, and related quantitative fields who are interested in designing efficient experiments, analyzing data, and making reliable scientific or practical decisions.

Other Information:

Experimental design is a powerful skill that is widely used in science, engineering, business, healthcare, social sciences, and modern AI applications. This course provides practical tools for designing studies, improving decision making, and extracting reliable insights from data, making it valuable for students from many different majors. Through real-world examples and hands-on applications, students will learn how experiments drive innovation in areas ranging from clinical trials and public policy to machine learning and product development. Whether you are interested in research, industry, or data-driven problem solving, this course will provide versatile skills that are increasingly important across disciplines.