

## Statistics 407/507 - Experimental Design - Fall 2022

Instructor: Dr. Chris Williams

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Office Hours MWF 1:30-2:30 or by appointment.

Meeting times: MWF 12:30-1:20

Prerequisites: Stat 431 or equivalent coursework.

### Course Text

[A First Course in Design and Analysis of Experiments](#) - Gary W. Oehlert from the University of Minnesota. This book is freely available under a Creative Commons License.

### Course Website

<https://www.webpages.uidaho.edu/~chrisw/stat507live/>

The website will contain announcements, summaries of lectures, lists of assignments, and other information.

The website and Canvas complement each other and will both be used throughout the course. Be sure to use the link above, if you google the course you may end up on a previous year's version!

### Course Goals

Define quantitatively the most efficient ways to obtain knowledge from experiments with differing constraints for number of treatments, replicates, classes of experimental objectives, and blocking procedures in terms of the general linear model. Develop a quantitative, defensible strategy for experimentation. Develop an understanding of data analysis in models with factors.

### Course Learning Outcomes

1. Be able to distinguish between common experimental designs such as Completely Randomized, Randomized Complete Block, Completely Randomized Factorial, Latin Square, Confounded Block Designs, Fractional Factorial Designs, Repeated Measures Designs, Split-Plot and related designs.
2. Understand the issues involved in choosing between common experimental designs.
3. Be able to analyze data arising from common experimental designs.
4. Understand the use of response surface methods to identify important factors and settings for those factors to yield optimal responses.

### Lecture Outline and Software

We will cover most of the material in the text, to be detailed in the lecture schedule. We will use both the SAS and R computer packages, code will be available for both on the lecture page. Either choice will work fine for the course. We can use Canvas discussions as an additional way to give comments and ask questions.

## Grades

The course grade will be determined by four exams and an individual project. Two exams (the first and third) will be take-home only, while two others (the second and fourth) will have both a take-home and an in-class part. Take-home exam answers will be handed in on Canvas. The four exams constitute 85% of the course grade, allocated as 5%, 30%, 20%, and 30% across exams 1 to 4 respectively, while the project is 15% of the course grade. The course project will be handed in on Canvas.

There will be homework sets assigned but not collected, they will be reviewed in class and will exemplify the types of problems on the exams.

Students in the Stat 407 course can have the impact of their lowest exam score reduced by up to 20% of the course grade.

## Academic Honesty

You should be aware of University of Idaho policies concerning academic honesty (see Article II of the Student Code of Conduct). Breaches of academic honesty will not be tolerated and will result in an F for the course and referral to the Dean of Students for further disciplinary action.

## Center for Disability Access and Resources

University of Idaho is committed to ensuring an accessible learning environment where course or instructional content are usable by all students and faculty. If you believe that you require disability-related academic adjustments for this class (including pregnancy-related disabilities), please contact Center for Disability Access and Resources (CDAR) to discuss eligibility. A current accommodation letter from CDAR is required before any modifications, above and beyond what is otherwise available for all other students in this class will be provided. Please be advised that disability-related academic adjustments are not retroactive. CDAR is located at the Bruce Pitman Building, Suite 127. Phone is 208-885-6307 and e-mail is [cdar@uidaho.edu](mailto:cdar@uidaho.edu). For a complete listing of services and current business hours visit <https://www.uidaho.edu/current-students/cdar>.

## University of Idaho Classroom Learning Civility Clause

In any environment in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning. Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).