EAB 743: Experimental Design for the Health Sciences

Spring 2026

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Course Details

Instructor Information

Office Hours: T/W 1-3:30 PM	Class Hours: W 4-6:45 PM
Office: GTW 346	Classroom: BEH 102
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Course Description

This course is designed to provide thorough coverage of experimental design for students in the health sciences. Topics include single factor designs, factorial experiments, within-factor designs, nested designs, analysis of trend, and general linear models.

Course Prerequisites

EAB 703 or consent of instructor.

Course Objectives and Expected Learning Outcomes

1. Select quantitative and qualitative data collection methods appropriate for a given public health context. (MPH 02)
2. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate. (MPH 03)
3. Apply biostatistical methods and models to solve public health problems (PHD02)
4. Apply appropriate statistical methods according to study design. (PHDEAB01)

Materials

Textbook and Other References

- Maxwell, S. E., Delaney, H. D., & Kelley, K. (2017). Designing experiments and analyzing data: A model comparison perspective. Routledge.
- Lawson, J. (2010). Design and Analysis of Experiments with SAS. CRC press.
- Lawson, J. (2014). Design and Analysis of Experiments with R. CRC press.

Requirements

- Course notes are available on Canvas.
- Class activities and homework should be submitted through Canvas.
- We will mainly use `SAS` software, but `R` may be used occasionally.
- SAS is available on all the computers in the classroom as well as the computers at the School of Public Health building (3rd floor of Gateway Building). You can also access SAS using SAS OnDemand for Academics (SAS ODA).
- `R` and `RStudio` can be installed for free using the guide shown here. You can schedule an appointment with me for help in installing these software programs.

Grading Criteria

Graded Requirements

Problem Sets

Problem sets are composed by the examples and extra practices in each handout. These are designed to reinforce the understanding in course materials learned during each lecture. They will emphasize conceptual understanding and practical application of the material that we discuss in class, especially in computer computations and programming. Reading assignments may be included in some problem sets. Each problem set should be submitted on Canvas on the specified due date.

Final Project (Master's and PhD students)

The students will complete an individual final project in class. The final project will be a short write-up on how you would design an experiment to answer the health-related research questions posted from your project proposal. Students should choose a topic for the final exam by Week 8. The final project will be due on the day when the class is scheduled to take the final exam at 11:59 PM.

Review Paper (PhD students)

PhD-level students should select a paper from their research field and review the experimental design used and statistical analysis performed in the study. The students must evaluate if the researchers used the most appropriate for the research question and give suggestions for improvement, if needed. The review paper is due on the last day of class before finals week.

Grade Breakdown

Master's-level students

Requirement	Weight
Problem Sets	60%
Final Project	40%
Total	100%

PhD-level students

Requirement	Weight
Problem Sets	60%
Final Project	30%
Review Paper	10%
Total	100%

Assignment of Grades

Percentage Grade	**Letter Grade**
>93%	A
>90%	A-
>87%	B+
>80%	B
>75%	C
>70%	D
<70%	F

University Policies and Accreditation

University Policies

Please refer to this link for university policies: https://www.unlv.edu/policies/students

Additional Information

Assignments completed for this course may be used as evidence of student learning in accreditation reports. Students who do not wish their work to be used for accreditation purposes must inform the course instructor in writing by the end of late registration. Your participation and cooperation are appreciated.

Tentative Schedule

Chapter numbers are based on the MDK book. Dr. Fudolig reserves the right to change the schedule and requirements for this course; appropriate notice of any changes will be made during scheduled classes.

Date	Day	Topic	Chapter
2026-01-21	Wednesday	Review of EAB 703 Concepts	-
2026-01-28	Wednesday	Conceptual Bases of Experimental Design	Chapters 1
2026-02-04	Wednesday	Conceptual Bases of Experimental Design	Chapters 1
2026-02-11	Wednesday	Between Subjects Designs: Mean Comparisons	Chapters 3
2026-02-18	Wednesday	Between Subjects Designs: Mean Comparisons	Chapters 3
2026-02-25	Wednesday	Between Subjects Designs: Factorial Designs	Chapters 7
2026-03-04	Wednesday	Between Subjects Designs: Factorial Designs	Chapters 7
2026-03-11	Wednesday	Designs with Random Effects	Chapters 9
2026-03-18	**Wednesday**	**Spring Break**	**Spring Br**
2026-03-25	Wednesday	Designs with Random Effects	Chapters 9
2026-04-01	Wednesday	Within-Subject Designs: Univariate Approach	Chapters 1
2026-04-08	Wednesday	Within-Subject Designs: Univariate Approach	Chapters 1
2026-04-15	Wednesday	Within-Subject Designs: Multivariate/Mixed Effects Models	Chapter 13
2026-04-22	Wednesday	Within-Subject Designs: Multivariate/Mixed Effects Models	Chapter 13
2026-04-29	**Wednesday**	**Writing Break (No class)**	**Final Pro**
2026-05-06	**Wednesday**	**Writing Break (No class)**	**Final Pro**