

**University of Florida
College of Medicine
Department of Epidemiology & Health Policy Research**

GMS 6841 - Design and Analysis of Translational Research in Biomedical Sciences

Time: Friday 2:45-4:55pm

Location: Room 5250, 1329th Building

Credits: 2

Instructors: Wei Hou, Ph.D.
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Office Hours: TBA

Course motivation and description:

Translational research in biomedical sciences requires appropriate design and statistical analysis. This course introduces the needed intermediate techniques. The student is expected to use what they learn both in their own research and in evaluating the work of the others.

The course includes introduction and biomedical application of common statistical analysis methods and widely used experimental design techniques including hypothesis testing, study design, confidence intervals, multiple regression, longitudinal data analysis, Non-linear regression for pharmacokinetics and pharmacodynamics, Kaplan-Meier estimates, proportional hazards models, randomization, and power analysis. The use of the SPSS computer package will be emphasized in classes, which provide ample opportunity for hands-on experience with data analysis. The class will use examples from the literature in fields related to students' interests.

Objectives:

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

- 1) Understand many statistical methods used by biomedical science researchers in daily life.
- 2) Choose appropriate methods, models, parameters and hypotheses for a variety of problems related to estimation and hypothesis testing for population means or proportions, linear regression, logistic regression and survival analysis.
- 3) Understand many statistical designs and identify practical and computational issues regarding their analysis.
- 4) Run SPSS programs and interpret SPSS output from these programs.

Prerequisite:

College algebra

Statistical reading:

Each student will be asked to find ten articles in his/her field using all statistical methods covered in this course and to write a summary report on use of statistics for each article. The instructor will select 2-3 articles to discuss in each class and ask the students in turn to deliver a 5-10 minutes presentation of the summary reports at the beginning of the class.

Course project:

Each student will be asked to conduct and present a course project. The project will require the student to propose a scientific question, design the study, collect data, analyze the data and write a report (no more than 5 pages). The students are encouraged to use real data from their real life research. The student will be expected to decide on a topic during the first five weeks of class. The student will then spend most of the semester researching and putting together the project, which will be presented to the class at the end of the semester.

Grading:

Grades will be based on the homework assignments (30%), statistical reading (20%), the course project (40%) and attendance and participation in class (10%). **All students are required to perform all work independently.** The student can only receive assistance from the instructor on these assignments. The students may be asked to give their pledge in writing that this was indeed the case. Violation of this pledge will result in an Honor Code violation and will be reported as such.

The final grade will be assigned according to the following scale: A (93 or higher), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D (60-69), and F (<59).

CLASS ATTENDANCE

Class attendance is mandatory. Excused absences follow the criteria of the UFL Graduate Catalogue (e.g., illness, serious family emergency, military obligations, religious holidays), and should be communicated to the instructor prior to the missed class day when possible. Missing more than unexcused absences will result in a failure. Regardless of attendance, students are responsible for meeting the scheduled due dates for class assignments.

Students with disabilities:

Students requiring accommodations must first register with the Dean of Students' Office. The Dean of Students' Office will provide documentation to the student who must then provide this documentation to the faculty member when requesting accommodation. The

College is committed to providing reasonable accommodations to assist students in their coursework.

Academic integrity:

Each student is bound by the academic honesty guidelines of the University and the student conduct code printed in the Student Guide and on the University website. The Honor Code states: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." Cheating or plagiarism in any form is unacceptable and inexcusable behavior.

Text books:

SPSS for Windows Step by Step: A Simple Guide and Reference, 16.0 Update (9th Edition). SPSS license and laptop are required for the classes.

Tentative schedule:

Week	Date	Room	Topics Covered
1			Introduction
2			data collection and management
3			Random Variables and Probability
4			Estimation and Hypothesis Testing for Two Population Means
5			Estimation and Hypothesis Testing for Proportions
6-7			ANOVA and Completely Randomized Design
8-9			Simple Linear Regression and Correlation
10-11			Multiple Regression
12			Logistic and Nonlinear Regression
13			Survival Analysis: Kaplan-Meier/Log Rank test
14			Cox Proportional Hazard Model
15			Project Presentation

Each session will meet for two class periods.