

# STATISTICAL MODELING WITH APPLICATIONS IN CLINICAL RESEARCH

## CMED 458 - Spring 2010

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**Time:** Mondays & Wednesdays, 5pm-7pm.

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### Course Description

This course is designed to build on the basic skill sets obtained in an introductory biostatistics course. Here we present an in depth exploration of multivariable models including assessment of assumptions, variable selection, model diagnostics and goodness-of-fit. The goals of the course are to learn the basic skills necessary to select, develop and interpret commonly encountered statistical models. A heavy focus is on critiquing the medical literature, with approximately half of the class sessions taught from journal articles. If you are involved in performing clinical research, evaluating clinical research, or simply desire a better understanding of statistical models utilized in clinical research, then this course is for you.

### Course Objectives

1. Choose appropriate methods, models, and hypothesis tests for data analyses related to linear regression, analysis of variance, logistic regression, survival analysis, and repeated measures analysis.
2. Check the underlying assumptions for each method.
3. Conduct diagnostics and goodness-of-fit for each method.
4. Develop skills in interpreting results
5. Run SAS programs related to these types of analyses and interpret the output.
6. Appreciate, evaluate and gain an understanding of the presentation of statistical findings in medical literature.

### Textbooks

*Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models*, Vittinghoff E, Glidden DV, Shiboski SC, and McCulloch CE. Springer, 2005.

### **Anonymous Reviews**

“Overall, this class has given me a much better understanding of trial design and interpretation of results. I have already noticed an improvement in my reading of clinical literature and in my confidence about planning my own studies.”

“Through this course, I certainly have gained a lot of knowledge in various multivariable models, their corresponding model assumptions, interpretations and evaluation techniques, and could apply this knowledge to the evaluation of goals and results in published studies (as we have done on numerous occasions in class) as well as to my own research endeavors.”

“I previously took the statistical analysis as a “black box”. I now have more knowledge with which to critically analyze medical research.”

“The course increased my comfort level with interpreting the most common statistical models presented in the medical literature. I would highly recommend this course to future physician-researchers-in-training.”