BIOS 667: Longitudinal Data Analysis 
Fall 2017 

Location and Time:
Class: 1:25-2:40 Monday and Wednesday, MC 1301

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Graders:
tba
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Text:

Supplemental Resources:

Software:
- SAS (including IML, required)
- R (highly encouraged)

Topics:
- Basic linear model background
- Example: Understanding marginal versus conditional effects
- Why special methods for LDA?
- The objectives of LDA.
• The various types of models used in LDA, their application, interpretation and statistical inference.

• The role of study design and sampling schemes.

• Random-effects (mixed) models.

• Marginal models.

• Conditional models.

• Maximum-likelihood, generalized estimating equations, conditional likelihood and other methods of estimation.

• Regression diagnostics.

• Missing data.

• Sample size calculations.

• Simulation.

Prerequisite is BIOS 632. Knowledge of SAS and basic matrix algebra are assumed.

**Learning Objectives:**

• Gain an understanding of the basic ideas of longitudinal data analysis

• Hone skills in fitting and interpreting longitudinal data models for addressing scientific questions that arise in public health and medicine

• Gain skills in study design and sample size calculations for longitudinal studies

Copies of presentations used in class will be available online on Sakai. These notes either cover some material not contained in the texts or are condensed summaries of the lectures. So, the assigned readings are very important.

Course credits: I have drawn heavily on the work of professors and colleagues when creating the course, and in particular the work of professors: Liang and Zeger at Johns Hopkins, Fitzmaurice, Laird, Ware, and Williams at Harvard; Edwards, Helms, Muller, Stewart and Herring at UNC, Dividian at NC State.

**Grades**

Homework assignments and quizzes: 30%

Two Midterm Exams: dates tbd, 35%
Cooperation on homeworks and discussing them with any one other than the instructor is **not allowed**.

The Graduate School uses the grades H (clear excellence), P (entirely satisfactory), L (low pass), and F (failure). Graduate students are expected to earn “P” grades, with remarkable performances rewarded with other grades from the scale as appropriate. Class participation may modify the association between the numeric average and assigned letter grade.

**Honor Code:**
Students in BIOS667 are expected to abide by the UNC Honor Code. All suspected Honor Code violations will be reported to the UNC Dean of Students, who will investigate the case. These investigations typically involve lengthy hearings of the Honor Court, and as outlined in the Instrument of Student Judicial Governance, “The usual sanction for a first academic violation is definite suspension for at least one academic semester and a grade penalty of an ‘F’ for the course, a portion of the course, or the assignment.”