BIOSTATISTICS 667
Applied Longitudinal Data Analysis, Fall 2016
Monday-Wednesday, 1:25-2:40 pm, Room: Rosenau 235

Text: Available at Health Affairs Bookstore, Medical Drive


**Instructor:** Lloyd J. Edwards, Ph.D.
Associate Professor, Department of Biostatistics
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**Office Hours:**

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<tr>
<th>Instructor: Lloyd Edwards</th>
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Also by appointment, if necessary. Please call if you wish to see me or the instructional assistant.

**Note:** Just before class is not a good time to schedule a meeting with the instructor.

**Course Prerequisites:**

Students should be familiar with basic notions of probability, random variables, and statistical inference; analysis of variance; and (multiple) linear regression at the level of Bios 663. Familiarity with matrix algebra is also needed. We will review matrix algebra at the beginning of the course and make considerable use of matrix notation and operations throughout. SAS will be used extensively in the class and hence students are expected to have had some exposure to the use of SAS. The course is required for Bios masters students and the material is presented at the level of 2nd year Bios majors. The underlying mathematical theory will not be overly stressed, and the main focus will be on concepts and applications.

**Grading Procedure:**

Grade based on 4-6 homeworks (50% of grade) and 2 exams (50% of grade). **ALL homeworks and exams are to be typed in a scientific word processor of your choice and emailed to the instructor as a PDF.**

Exam 1: Mid-Term covers all material up to Wednesday, October 19, 2016 (25% of grade).
Exam 2: Final Exam, cumulative with emphasis on post-Mid-Term material, Monday, December 12, 2016, 12:00 pm - 3:00 pm (25% of grade).

**HOMEWORK / EXAM POSTPONEMENT POLICIES- PLEASE NOTE WELL:**
An incomplete will result if any homework is not attempted in good faith.
I require a medical excuse or the equivalent to postpone a test. Call me as soon as possible!

**Course Goals for the Student:**

To introduce students to statistical models and methods for the analysis of longitudinal data, i.e. data collected repeatedly on individuals (humans, animals, plants, samples, etc) over time (or other conditions).
Course Outline


II. General Linear Model for Longitudinal Data (Population Average Models for Continuous Outcomes)

III. Linear Mixed Model (Mixed-Effects Regression Models for Continuous Outcomes)

IV. Generalized Linear Model for Nonnormal Longitudinal Data

V. Generalized Linear Mixed Model for Nonnormal Longitudinal Data