

April 4, 2006

GENERAL INFORMATION

This document and other course materials are available at:

<http://www.biostat.jhsph.edu/~tlouis/BIO656/bio656.index-2006.html>**Meeting Times & Locations****Lecture:** TuTh 3:30-4:50 in W2030**Labs (attend one):** Tuesday 2:00-3:20 in W2009; Thursday 2:00-3:20 in W2009**TA Office Hour:** Tu 1:00-2:00 in E3130 Wolfe**Faculty**

Michael Griswold: E3153, 410.502.3828, mgriswol@jhsph.edu

Thomas A. Louis: E3545, 410.614.7838, tlouis@jhsph.edu

Teaching Assistants (email bio656@jhsph.edu)

Sheng Luo (E3038 Wolfe); Shu-Chih Su (E3040 Wolfe); Yijie Zhou (E3038 Wolfe)

Credits & Prerequisites: 4 units; 140.621-24 or 140.651-4 required; 140.655 highly recommended**Text and readings:** All materials will be web-available; see the course web page.

Course Requirement	Percentage of Grade	Notes
Homework exercises:	40	4 assignments, each with a due date
Midterm examination:	30	In class on Thursday, April 27 th
Term Project:	30	Due Friday, May 19 th before midnight

Learning Objectives: Through active learning, students will acquire a basic understanding of concepts, computations and interpretations associated with MLMs; a basic understanding of when and why MLMs can or should be used; when they are unnecessary or possibly dangerous; functional familiarity with related computing.

Content & Approach: Conceptual and formal approaches to the design, analysis, and interpretation of studies with a multilevel or hierarchical (clustered) data structure (e.g., individuals in families in communities). Development and implementation of random effect, variance component models that reflect the multi-level structure for both predictor and outcome variables. Building hierarchies; interpretation of population-average and level-specific summaries; estimation and inference based on variance components; shrinkage estimation; Bayesian interpretation; diagnostics and sensitivity analyses. Computing via WinBUGS and Stata (and SAS for those who are familiar with it). Application to health services, risk assessment, community intervention and small area estimation.

Structure: Using illustrations and case studies, lectures will address basic and intermediate concepts and models, identify key modeling and interpretation issues. Labs will address computing and elaborate on issues identified in the lectures. Homework and the term project will reinforce understanding of model development, implementation and interpretation.

Rules for homework, the midterm exam and the term project

- **Homework** must be individually prepared. It is permissible to obtain advice. Due dates should be honored. Turn in **hard copy** for grading.
- The **in-class, midterm** must be prepared absolutely independently. During the exam, no advice or information can be obtained from other students. Reference materials and notes can be used.
- The **term project** can be individually or jointly prepared between two (no more than two) students. It is permissible to obtain advice. Must be **electronically submitted**.