BSTA 656  
Longitudinal Data Analysis  
Fall 2, 2023

**Instructor**  
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**Hours**  
Class – Tuesday and Thursday, 8:30am-10:00am, Room: Blockley 701

**Evaluation**  
Homework: 60%  
Take-home final exam: 40%  
**Late Penalty**: 1 letter grade reduction (10 points) per day late.

**Recommended Texts**  

**Topics**

1. **Linear Mixed Models for Correlated Data**  
   LMM; MLEs; Fixed effects; Random effects; BLUPs; EM; Restricted MLEs (REMLs); Variance components;

2. **Generalized Linear Models and Quasi-likelihood**  
   Exponential family; Mean-variance relationship; Link functions; MLEs; Weighted least squares; Hypothesis testing; Over-dispersion; Estimating equations; Quasi-likelihood Functions.

3. **Generalized Estimating Equations**  
   GEE; Robust covariance estimation; Hypothesis Testing in GEE;

4. **Generalized Linear Mixed Models**  
   Relationship between GEEs and GLMMs; Likelihood; Approximate inference (PQL); MLEs; EM; Conditional inference.