

BSTA 656
Longitudinal Data Analysis
Fall 2, 2023

Instructor	Ian Barnett Email: ibarnett@pennmedicine.upenn.edu Office hours: 10:00am-11:00am on Tuesdays
Teaching Assistant	Zhuoran Ding Email: dingzh@pennmedicine.upenn.edu Office hours: TBD
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	Diggle, Heagerty, Liang and Zeger (2002). Analysis of Longitudinal Data, Oxford University Press.
Topics	<ol style="list-style-type: none">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.