

**BSTA 656**  
**Longitudinal Data Analysis**  
**Fall 2, 2021**

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<b>Teaching Assistant</b>	Jaiyi (Jessie) Tong Email: <a href="mailto:jjayi.tong@pennmedicine.upenn.edu">jjayi.tong@pennmedicine.upenn.edu</a> Office hours: Mondays 4:00pm-5:00pm or by appointment
<b>Hours</b>	Class – Monday and Wednesday, 10:15am-11:45am, Blockley 245
<b>Evaluation</b>	Homework: 60% Take-home final exam: 40%
<b>Recommended Texts</b>	Diggle, Heagerty, Liang and Zeger (2002). Analysis of Longitudinal Data, Oxford University Press.
<b>Topics</b>	<ol style="list-style-type: none"><li><b>1. Linear Mixed Models for Correlated Data</b> LMM; MLEs; Fixed effects; Random effects; BLUPs; EM; Restricted MLEs (REMLs); Variance components;</li><li><b>2. Generalized Linear Models and Quasi-likelihood</b> Exponential family; Mean-variance relationship; Link functions; MLEs; Weighted least squares; Hypothesis testing; Over-dispersion; Estimating equations; Quasi-likelihood Functions.</li><li><b>3. Generalized Estimating Equations</b> GEE; Robust covariance estimation; Hypothesis Testing in GEE;</li><li><b>4. Generalized Linear Mixed Models</b> Relationship between GEEs and GLMMs; Likelihood; Approximate inference (PQL); MLEs; EM; Conditional inference.</li></ol>