

STAT 5902 W: Seminar in Biostatistics

Course Information, Fall 2022

Lectures: Tues & Thurs 11:35–12:55 **Room:** ONLINE

NOTES: Lectures will be given live using Zoom during lecture times. The meeting ID will be posted at Brightspace. When joining in the Zoom meeting, please make sure the account displays your first and last names, so that I can recognize you when admitting to the meeting.

Instructor: Dr. Sanjoy Sinha

Office: HP 5221

Office hours: Virtual meeting (by appointments only)

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Marking Scheme:

Assignments: 40%

Project: 20%

Final Exam (Take-Home, April 14, 2022): 40%

Textbook:

Title: Analysis of Longitudinal Data

Authors: P. J. Diggle, P. Heagerty, K. Y. Liang, and S. L. Zeger

Publisher: Oxford University Press, 2nd edition 2002.

Software: The statistical computation will involve the use of the statistical package **R**, which can be downloaded from the internet free of charge.

Prerequisite: Students are expected to have good background in statistical inference. It will be assumed that they are familiar with the basic concepts of point and interval estimation, hypothesis testing using model based likelihood methods as well as other nonparametric methods.

Course outline:

We shall discuss methodologies for analyzing various types of biostatistical data including longitudinal and clustered correlated data from clinical experiments. Topics will include:

1. Generalized linear models
2. Analysis of binary and Poisson count data
3. Generalized linear mixed models for dependent data
4. Analysis of clustered correlated data
5. Modelling longitudinal data
6. Marginal models
7. Conditional models
8. Methods for analyzing longitudinal data
9. Missing data

Reference books:

Fitzmaurice, G.M., Laird, N. M., and Ware, J. H. (2004). *Applied Longitudinal Analysis*, Wiley.

McCulloch, C. E. and Searle, S. R. (2001). *Generalized, Linear, and Mixed Models*, Wiley.

Notes:

1. Students wishing to see their final examination papers must make an appointment within two weeks of the examination.
2. The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (if applicable).