STAT 536E
Statistical Theory for the Design and Analysis of Clinical Studies – BIOSTAT METHODS

Instructor: Lang Wu, Department of Statistics, UBC, Vancouver
.   *Office: ESB 3126,   Email : lang@stat.ubc.ca*

Lectures: Tuesday & Thursday, 4:00pm – 5:30pm, ██████████ Jan 8 – Feb 15, 2024, **1.5 credits**.

Class webpage: UBC Canvas STAT 536E

Prerequisite: Open to any interested graduate students in the Department of Statistics. Graduate students from other departments are welcome, provided they have sufficient statistical and mathematical backgrounds (roughly, mathematical statistics to the level of UBC STAT 460/461). Such students should consult the instructor about suitability. To be clear, this course is aimed at training statisticians or biostatisticians, so understanding the math and computing behind the methods is the central part of the course.

Class format: A combination of lectures and in-class activities. Class attendance is required. You are strongly encouraged to ask questions in class and actively participate in-class discussions. You are also encouraged to discuss course materials on **Piazza** via Canvas.

Text: No required textbook. Lecture notes and slides will be posted on Canvas.

Course descriptions: This course covers basic ideas of some commonly used statistical models and methods in epidemiologic studies and health research. Statistical software R will be used in class. **Topics:** 1). Analysis of binary data, including 2×2 tables and Fisher's exact test; 2). Analysis of longitudinal data, mixed effects models, GEE models, joint models of longitudinal and survival data; 3) Missing data analysis, EM algorithm, multiple imputation, dropouts; 4) Case studies; 5) If time permits: model selections, confounding, etc.

Evaluation: Class participation (attendance, in-class activities/discussion) 20%, homework 30%, oral presentation: 10%, final project (written report) 40%. The weights may be adjusted if necessary.

References:

Lachine, J.M. (2000). Biostatistical Methods: The Assessment of Relative Risks, Wiley.

Vittinghoff, E., Glidden, D.V., Shiboski, S.C., and McCulloch, C.E. (2011). Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models. Second edition, Springer.