STAT 536E

STATISTICAL THEORY FOR THE DESIGN AND ANALYSIS OF CLINICAL STUDIES

January 12 – March 11, 2021 (2 credits)
"BIOSTAT METHODS"

Instructor: Lang Wu, Dept of Statistics (*Email*: lang@stat.ubc.ca).

Lectures: Tuesday & Thursday, 9:30am – 11:00am, ESB 4192

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.

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

Descriptions: The course covers basic ideas of some commonly used statistical models and methods in practice, especially in epidemiologic studies and health research. Since this course covers a wide variety of topics, the emphasis will be on *understanding* of the basic ideas and theory (rather than detailed derivations), *applications* of the models/methods, and data analysis skills in general. Students interested in detailed descriptions of these topics are suggested to read the references listed below. Statistical software R will be used in class.

Topics: 1) Types of studies/designs in biostatistics; 2). Analysis of binary data, including 2×2 tables; 3). Analysis of survival data, including censoring, KM estimator, log-rank test, Cox models, and AFT models; 4). Analysis of longitudinal data and clustered data, including mixed effects or random effects models and GEE models; 5). Other topics (if time allows), including model selections, confounding, missing data, etc.

Evaluation: Class participation & in-class activities 20%, homework 30%, final project 50%. The weights may be adjusted if necessary.