

**STAT-854. Biometrics: Methods in Biomedical Studies**  
**January 4 - April 11 2023**

**Lecture**

- TuTh 15:30-17:20 PST; WMC2268
  - An outline of each lecture will be posted in the course's [webpage](#) and [canvas-page](#) before the lecture time.
- Instructor: X. Joan Hu (<http://www.sfu.ca/~joanh/>), SSC K10555 (SFU - Burnaby Campus), 778-782-6714, [joanh@stat.sfu.ca](mailto:joanh@stat.sfu.ca)
- Office Hours: Tuesday 13:30-14:20 or by appointment; SSC K10555

**Reference Books**

- *Epidemiologic Methods: Studying the Occurrence of Illness*, by TD Koepsell and N.S. Weiss, Oxford University Press, 2003
- *Fundamentals of Clinical Trials*, by LM Friedman, CD Furberg, and DL DeMets, Springer, 2010
- *Epidemiology* (fourth edition), by L Gordis
- *Clinical Trials: A Methodologic Perspective* (second edition), by S Piantadosi
- More to provide as the course progresses.

**Topics to Be Covered**

1. Introduction
2. History of epidemiology, and widely-used concepts and terminology in biomedical studies
3. Measures of disease occurrence and association.
4. Design of medical studies: cohort and case-control studies; controlled clinical experiments.
5. Models and analysis in prospective and retrospective studies.
6. Clinical trial design principles: bias control, random error control, randomization, blocking, masking
7. Types of clinical trials: phases of trial, translational, dose-finding, cross-over, safety and efficacy, and comparative trials.
8. Study monitoring: sequential methods.
9. Selected important topics in biostatistics: survival analysis, longitudinal analysis, missing data, causal inference, ... ..

## Computing

Your choice (R and SAS are recommended)

## Evaluation

- Homework Assignments (30%) (to be assigned in Weeks 3, 10)
- Project A (30%)
  - Phase I (10%): to propose for a research project (to be assigned in Week 5)
  - Phase II (20%): to report your conduct of the project (to be assigned in Week 7)
- Project B (30%)
  - Phase I (10%): to review a research paper and submit a review report (to be assigned in Week 12)
  - Phase II (20%): to present the review (time and place – TBA)
- Project C (10%)
  - To submit a revision of either the report of Project A or the one for Project B (in Week 15)
- Class Participation (bonus upto 10%)

## Remarks

- No homework/project is accepted after the due time: please turn in the available portion, if you cannot complete the whole homework/project in time.
- Group discussions are encouraged; however, the homework/projects to be evaluated should be independent work.
- Discussions in-class are highly encouraged. The whole class will participate in evaluating the presentations.

## Links to Course Pages

Course webpage: <http://www.sfu.ca/~joanh/stat854web.html>

Course canvas-page: <https://canvas.sfu.ca/courses/75997>