BSTA 754
Advanced Survival Analysis
Fall I 2022 Syllabus

- <u>Course Description</u>: An advanced course in survival analysis, intended to equip students with the knowledge necessary to apply and understand advanced techniques used in survival analysis, and to serve as a starting point towards methods research in the area. Lectures are a blend of concepts, estimation/inference, and applications. Some emphasis is given to competing risks, recurrent events and time-dependent covariates since these are incompletely described in the current literature. Methods for the analysis of more complex data structures are considered.

- <u>Credit</u>: 0.5 credit hours

- <u>Course Prerequisites</u>: BSTA 622 (may be taken concurrently), or permission of instructor

- <u>Lectures</u>: Tue/Thu, 12:00-1:30 in Blockley Hall Room 701; (8/31 to 10/18)

- <u>Instructor</u>: Douglas Schaubel, Ph.D (email: douglas.schaubel@pennmedicine.upenn.edu; office: Blockley Hall: 614)

- <u>T.A.</u>: Zhuoran Ding (dingzh@pennmedicine.upenn.edu)

- <u>Office Hours</u>: Instructor: Thursday: 2:00–3:00; other times are available by appointment.
  TA: TBA

- <u>Text</u> Various book excerpts will be posted

- <u>Computing</u>: SAS, R, Python (student's choice)

- <u>Grading</u>:

  ○ Homeworks: 60%

- ○ Exam (24-hour take-home): 40% (To be assigned 10/13 at 5:00 pm; due 10/14 at 5:00 pm)

- Topics (ordering is approximate):

  - ○ Introduction and fundamentals
  - ○ One-sample estimators
  - ○ Competing risks
  - ○ Counting processes and Martingales
  - ○ Two-sample tests
  - ○ Proportional hazards regression
  - ○ Additive hazards regression
  - ○ Multivariate survival
  - ○ Analysis of recurrent event data
  - ○ Temporal process regression
  - ○ Landmark analysis
  - ○ Causal inference with censored outcomes
  - ○ Modeling restricted mean survival time