

**BSTA 7980: Special topics in biostatistics**

Tuesdays and Thursdays 1:45 pm – 3:15 pm, August 31 to October 18, 2023  
418 Blockley Hall

**Course director**

Mingyao Li, PhD  
Professor of Biostatistics  
213 Blockley Hall  
Email: mingyao@penntermedicine.upenn.edu  
Phone: 215-746-3916  
Office Hours: By appointment

**Course Description**

This course is designed for second-year PhD students in Biostatistics. The goal is to provide an in-depth exploration of special topics within the field of biostatistics. The course covers a range of advanced statistical methods and their applications in various biostatistical domains, including clinical trials, causal inference, survival analysis, genetics and genomics, neuroimaging, and health informatics. The course emphasizes the unique aspects of these topics and their significance in biomedical research and public health. Throughout the course, ten faculty members will deliver presentations, each focusing on a special topic.

**Prerequisites**

BSTA 621, BSTA 631, BSTA 651, BSTA 652, BSTA 653 or permission of course director

**Course Requirements**

Each faculty member will post their slides one week in advance, and students are required to submit 1-2 questions to the instructor based on the slides. During each lecture, students are expected to actively participate in discussions inspired by the set of questions submitted by their fellow students. The last three classes will be dedicated to student presentations. Each student is required to give a presentation, where they can choose a topic based on one of the lectures. The presentation should focus on reviewing the latest developments related to the selected topic or conducting data analysis related to the chosen topic.

**Course Grading**

Class participation (60%)

Final presentation (40%): Each student needs to give a 15-minute presentation on a chosen topic approved by the course director.

**Course Schedule**

| Date            | Topic  | Faculty        |
|-----------------|--|----------------|
| 8/31 (Thursday) | Spatial transcriptomics and pathology imaging        | Mingyao Li     |
| 9/5 (Tuesday)   | Clinical trials                                      | Kristin Linn   |
| 9/12 (Tuesday)  | Statistical genetics, genomics, and microbiome       | Hongzhe Li     |
| 9/14 (Thursday) | Integration of large-scale multi-source genetic data | Jin Jin        |
| 9/19 (Tuesday)  | Causal inference                                     | Nandita Mitra  |
| 9/21 (Thursday) | Mobile health and wearable device                    | Ian Barnett    |
| 9/26 (Tuesday)  | Electronic health records                            | Jinbo Chen     |
| 9/28 (Thursday) | Functional data analysis                             | Jeff Morris    |
| 10/3 (Tuesday)  | Imaging statistics                                   | Taki Shinohara |

|                  |                     |               |
|------------------|---------------------|---------------|
| 10/5 (Thursday)  | Survival analysis   | Doug Schaubel |
| 10/10 (Tuesday)  | Final presentations | 5 students    |
| 10/12 (Thursday) | Final presentations | 5 students    |
| 10/17 (Tuesday)  | Final presentations | 4 students    |