

Biostatistics I

Code: 31-3304 1st year 2units
Course ID: GP-b3304L

1. Instructor(s)

Kunihiko Takahashi, Professor, Department of Biostatistics
Tatsuhiko Anzai, Junior Associate Professor, Department of Biostatistics

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

This course introduces the basic techniques important for analyzing data from epidemiologic, biomedical and other public health related research. Statistical reasoning will be emphasized through problem solving and practical applications.

Outline

Biostatistics is the application of statistical methods to data in biological, biomedical and health sciences. It is a key technique for the collection, analysis, and presentation of data especially in quantitative studies. This course gives lectures on fundamental biostatistical methods through their applications to data in medical research field including clinical and epidemiological studies.

4. Course Objective(s)

By the end of this course, students will be able to:

- a) Interpret basic statistical terminologies.
- b) Explain assumptions and conditions for basic statistical techniques, and judge which statistical technique to use in a given situation.
- c) Conduct basic statistical techniques both by hand and using a statistical software, and present results using publication quality tables.
- d) Describe results of statistical analysis using standard statistical expressions.

5. Format

This course will consist of lectures and optional laboratory sessions (online video). Q&A system on WebClass and some optional hours will be prepared. There will be some reports. (Details will be announced later.)

6. Course Description and Timetable

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7. Grading System

Grades will be based on the following elements:

Participation (Watch online video (Lecture): 60% or more) 50%
Reports 50%

8 . Prerequisite Reading

Reading materials will be available online at the course webpage. Students are expected to have worked through the materials before attending the corresponding class.

9 . Reference Materials

Pagano M, Gauvreau K. Principles of Biostatistics. 2nd ed. Belmont: Brooks/Cole; 2000.

Rosner B. Fundamentals of Biostatistics. 8th ed. Brooks/Cole; 2015.

Altman DG. Practical Statistics for Medical Research. Chapman & Hall; 1991.

Armitage P. Statistical Methods in Medical Research. 4th ed. Blackwell Science Ltd; 2002.

1 0 . Important Course Requirements

For students not in the MPH course, instructor's permission is required before registering to the course.

1 1 . Availability in English

All classes are taught in English.

1 2 . Office hours

Please contact Prof. Takahashi at kunihikot.dsc@tmd.ac.jp

1 3 . Note(s) to students

Online Q&A system is available during the course, and a realtime Q&A session (optional, **May 31 and June 6, 2024, 14:40-, via zoom**) is prepared.

This course uses **the Stata and other statistical software**. Stata is available for each student during the course.

Students are expected to perform basic algebra, including logarithms and exponentials, by hand or using calculator.

This course is a prerequisite for Biostatistics II.

Schedule

No	Day	Time	Topics / Venue	Instructor
1	May 27, 2024	8:50-10:20	<u>Lecture:</u> Introduction to Biostatistics (online video)	Kunihiko Takahashi
2		10:30-12:00	<u>Lecture:</u> Data presentation; Numerical summary measures (1) (online video)	Tatsuhiko Anzai
3	May 28, 2024	8:50-10:20	<u>Lecture:</u> Data presentation; Numerical summary measures (2) (online video)	
4		10:30-12:00	<u>Lecture:</u> Probability and Theoretical distributions (1) (online video)	
5	May 30, 2023	8:50-10:20	<u>Lecture:</u> Probability and Theoretical distributions (2) (online video)	Kunihiko Takahashi
6		10:30-12:00	<u>Lecture:</u> Estimation (online video)	
Optional 1		13:00-14:30	<u>Laboratory session</u> (online video)	Kunihiko Takahashi Tatsuhiko Anzai
Optional 2		14:40-16:10		
7	May 31, 2024	8:50-10:20	<u>Lecture:</u> Comparing groups - continuous data (1) (online video)	Kunihiko Takahashi
8		10:30-12:00	<u>Lecture:</u> Comparing groups - continuous data (2) (online video)	
Optional 3		13:00-14:30	<u>Laboratory session</u> (online video)	Kunihiko Takahashi Tatsuhiko Anzai
Optional 4		14:40-16:10	<u>Q&A session</u> (via real-time zoom)	
9	June 3, 2024	8:50-10:20	<u>Lecture:</u> Comparing groups - categorical data (online video)	Tatsuhiko Anzai
10		10:30-12:00	<u>Lecture:</u> Analysis of Variance; Multiple comparison (online video)	
Optional 5		13:00-14:30	<u>Laboratory session</u> (online video)	Kunihiko Takahashi Tatsuhiko Anzai
Optional 6		14:40-16:10		

11	June 4, 2024	8:50-10:20	<u>Lecture:</u> Correlation; linear regression (online video)	Kunihiko Takahashi
12		10:30-12:00	<u>Lecture:</u> Multivariate analysis (1) (online video)	
Optional 7		13:00-14:30	<u>Laboratory session</u> (online video)	Kunihiko Takahashi Tatsuhiko Anzai
Optional 8		14:40-16:10		
13	June 6, 2024	8:50-10:20	<u>Lecture:</u> Multivariate analysis (2) (online video)	Tatsuhiko Anzai
14		10:30-12:00	<u>Lecture:</u> Multivariate analysis (3) (online video)	
Optional 9		13:00-14:30	<u>Laboratory session</u> (online video)	Kunihiko Takahashi Tatsuhiko Anzai
Optional 10		14:40-16:10	<u>Q&A session</u> (via real-time zoom)	
15	June 7, 2024	8:50-10:20	<u>Lecture:</u> Survival analysis (online video)	Tatsuhiko Anzai
16		10:30-12:00	<u>Lecture:</u> Genomics data analysis (online video)	