Clinical Biostatistics and Statistical Genetics

(Code : 8608 1st – 2nd year, 2 units)

Attendance hours	39
No attendance hours	
Total hours	

1. Instructors

Name	Position	Department	Contact Information
TAKAHASHI Kunihiko	Chief Instructor / Professor	Department of Biostatistics	kunihikot.dsc@tmd.ac.jp
ANZAI Tatsuhiko	Junior Associate Professor	Department of Biostatistics	tanzai.dsc@tmd.ac.jp

2. Classroom/Lab Lecture Location

Online video (via WebClass)

3. Course Purpose and Outline

Course Purpose:

This course introduces the basic techniques important for analyzing data from epidemiologic, biomedical (including clinical and genetic) 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 biomedical, biological, and health sciences. It is a key technique for the collection, analysis, and presentation of data especially in quantitative studies. Throughout the seminar, we will review the broad field of statistical data analysis and the range of issues that arise when analyzing health data. We will read and discuss selected chapters from a textbook and apply statistical methods to wide range of quantitative study questions.

4. Course Objectives

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

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

5. Lecture Style

This course will consist of lectures and optional laboratory sessions (online video). Q&A system on webclass or some optional hours will be prepared. There will be some homework assignments, and examination / reports. (Details will be announced later.)

6. Lecture plan

No.	Date	Time	Theme	Staff
1	May 29	8:50-10:20	Lecture: Introduction to Biostatistics	TAKAHASHI Kunihiko
2	May 29	10:30-12:00	Lecture: Data presentation; Numerical summary measures (1)	ANZAI Tatsuhiko
3	May 30	8:50-10:20	Lecture: Data presentation; Numerical summary measures (2)	ANZAI Tatsuhiko
4	May 30	10:30-12:00	Lecture: Probability and Theoretical distributions (1)	ANZAI Tatsuhiko
5	June 1	8:50-10:20	Lecture: Probability and Theoretical distributions (2)	TAKAHASHI Kunihiko
6	June 1	10:30-12:00	Lecture: Estimation	TAKAHASHI Kunihiko
Optional 1	June 1	13:00-14:30	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
Optional 2	June 1	14:40-16:10	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
7	June 2	8:50-10:20	Lecture: Comparing groups - continuous data (1)	TAKAHASHI Kunihiko
8	June 2	10:30-12:00	Lecture: Comparing groups - continuous data (2)	TAKAHASHI Kunihiko
Optional 3	June 2	13:00-14:30	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
Optional 4	June 2	14:40-16:10	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
9	June 5	8:50-10:20	Lecture: Comparing groups - categorical data	ANZAI Tatsuhiko
10	June 5	10:30-12:00	Lecture: Analysis of Variance; Multiple comparison	ANZAI Tatsuhiko
Optional 5	June 5	13:00-14:30	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
Optional 6	June 5	14:40-16:10	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
11	June 6	8:50-10:20	Lecture: Correlation; linear regression	TAKAHASHI Kunihiko
12	June 6	10:30-12:00	Lecture: Multivariate analysis (1)	TAKAHASHI Kunihiko
Optional 7	June 6	13:00-14:30	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
Optional 8	June 6	14:40-16:10	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
13	June 8	8:50-10:20	Lecture: Multivariate analysis (2)	ANZAI Tatsuhiko
14	June 8	10:30-12:00	Lecture: Multivariate analysis (3)	ANZAI Tatsuhiko

Optional 9	June 8	13:00-14:30	Laboratory session	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
Optional 10	June 8	14:40-16:10	Q&A session(via real-time zoom)	TAKAHASHI Kunihiko, ANZAI Tatsuhiko
15	June 9	8:50-10:20	Lecture: Survival analysis	ANZAI Tatsuhiko
16	June 9	10:30-12:00	Lecture: Genomics data analysis	ANZAI Tatsuhiko

7. Grading System

Grades will be based on the following elements:
Participation 20%
Homework exercise 30%
Final examination / report 50%

8. Prerequisite Reading

Reading textbook will be available online at the course webpage. Students are expected to have worked thorough 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.

10. Language Used

All classes are taught in English.

11. Important Course Requirements

Chief instructor's permission is required before registering to the course.
Also, students are required to have TOEFL iBT with a minimum score of 80 or IELTS with a minimumscore of 6.5.

12. Office Hours

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

13. Note(s) to Students

Online Q&A system is available during the course, and a realtime Q&A session (optional, June 8,2023, 14:00-, via zoom) is prepared.
This course uses the Stata statistical software. Stata is available for each student during the course.Students are expected to perform basic algebra, including logarithms and exponentials, by hand orusing calculator.