MATH 4423 Nonparametric Statistics

Course Outline - Fall 2023

1. Course Home Page

http://www.math.ust.hk/~maling/

2. Instructor

Dr. Shiqing Ling

Contact Details: Rm 3460; phone: 2358-7459; e-mail: maling@ust.hk

Office Hour: Wed, 4 to 6 pm.

3. Teaching Assistants

Cai Bibi

Contact Details: Rm 3214; phone: 2358-7467; bcaiaa@connect.ust.hk

Office Hour: Wed, 4 to 6 pm

4. Meeting Time and Venue

Lectures: WeFr 1:30PM - 2:50PM. Rm 2463, Lift 25-26

5. Course Description

Duration: one semester. Credits: 3 units.

Prerequisites: Math2411 or math3423 or equivalents.

Key topics: The sign test; Wilcoxon signed rank test; Wilcoxon rank-sum test; Kruskal-Wallis test; rank correlation; order statistics; robust estimates; Kolmogorov-Smirnov test

6. Assessment Scheme

Assessment	Assessing Course ILOs
Homework: 15 %.	1,2
Online Midterm Exams: 35 %.	1
Online Final Exam: 50 %.	1,2

7. Student Learning Resources

Lecture Notes:

Lecture notes (All exams and homework problems will be

based on the contents covered in lectures.)

Textbooks/ References:

- 1). Chapter 9 of ``Mathematical statistics: basic ideas and selected topics", 1st edition, by Bickel and Doksum; Publisher: Prentice-Hall.
- 2). ``Applied nonparametric statistics", 2nd edition, by Wayne W. Daniel; Publisher: Duxbury Classic Series.
- 3). ``Nonparametrics: statistical methods based on ranks", by E.L. Lehmann; Publisher: Holden-Day series in probability and statistics.

8. Teaching Approach

Lectures: focus on illustrating the concepts of the course content.

Tutorials: focus on examples and problem solving skills.

9. Intended Learning Outcomes

Upon successful completion of this course, students should be able to understand:

- 1).the nonparametric estimation method
- 2).the rank-based hypothesis test

10. Course Schedule

Week	Content	Remarks
1	Introduction .	
2-4	Rank methods for one-sample problem	
4-6	Rank methods for two-sample problem	
7	Rank test for one-way layout	
8-9	Nonparametric methods for linear regression and association	
10	Goodness-of-fit tests. (Kolmogorov-Smirnov tests	
11-12	Order statistics and related statistics	
12-13	Robust estimation and related topics	