MATH 4423 Nonparametric Statistics

Course Outline - Fall 2024

1. Course Home Page

Available on Canvas.

2. Instructor

Dr. Xiaoran Wu

Contact Details: Rm 3478; e-mail: wuxiaoran@ust.hk

Office Hour: Tue, 4 to 6 pm.

3 . Teaching Assistants

KAZOVSKAIA Anastasiia (Ana)

Contact Details: Rm 4381; phone: 6844-8483,

akazovskaia@connect.ust.hk

4. Meeting Time and Venue

Lectures: TuTh 01:30PM - 02:50PM, Rm 1032, LSK Bldg

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	