Marshall University

College of Science

Mathematics Department

MTH 420/520: Nonparameteric Statistics

Course catalog description

Coverage of a variety of nonparametric or distribution-free methods for practical statistical inference problems in hypothesis testing and estimation, including rank procedures and randomization procedures.

Credit hours

3 hours

Prerequisites

For MTH 420: A grade of C or higher in a previous course in statistics

List of topics

- Motivation behind nonparametric statistics?
- The binomial sampling distribution
- Binomial test for median or percentiles and Confidence intervals for median or percentiles
- Tests for paired data: The sign test and Wilcoxon Signed-Ranks Test
- Introduction to permutation tests (part 1)
- Two sample problem: Wilcoxon rank-sum test and Wilcoxon confidence intervals for a shift parameter
- Two nonparametric tests for equality of variances
- Introduction to k-sample problems: Permutation F-test and Kruskal-Wallis test and multiple comparison.
- Tests for trends and association: Spearman rank correlation, Kendall's Ï„ and Fishers Exact Test for a 2 Ã— 2 contingency table 181
- Introduction to bootstrapping: Estimation and Hypothesis Testing.
- Smoothing methods and Robust model fitting: Kernel density estimation and robust regression

Suggested textbooks

- *Nonparameteric Statistical Inference, 5th edition, Gibbons and Chakraborti, CRC PRess. ISBN 978-142-007761-2*

Supplemental texts

- *Introduction to Modern Nonparametric Statistics by J. J. Higgins, Duxbury (Thomson).*
- *Nonparametric Statistical Methods, 2nd Edition, by M. Hollander and D. A. Wolfe, Wiley.*
- *Applied Nonparametric Statistical Methods, by P. Sprent and N. C. Smeeton.*

Last updated

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