960:555– Nonparametrics– Fall, 2022

Course Information

Instructor: John E. Kolassa

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Please do not send e-mail with formats other than plain text or PDF.

OFFICE: Hill Center 565. ☎ 848-445-7674, but please email rather than call.

HOURS: 2-3 W, 2-3 H.

Course Meeting Time: We 6:00 – 9:00 PM SEC 202 DATES: 7 Sep – 14 Dec, BUT: No class 23 Nov.

Text:

REQUIRED: 1. Kolassa, J.E. (2020), *An Introduction to Nonparametric Statistics*, London: Taylor and Francis.

RECOMMENDED: Most are on reserve in the Hill Center Library.

2. Higgins, J.J. (2004), *Introduction to Modern Nonparametric Statistics*, Pacific Grove, CA: Thompson - Brooks/Cole.
3. Maronna, R.A. and Martin, R.D. and Yohai, V.J. (2006), *Robust statistics: Theory and Methods*, Chicester, England: J. Wiley.
4. Richter, S.J. and Higgins, J.J. (2004), *A SAS Companion for Nonparametric Statistics*, Pacific Grove, CA: Thompson - Brooks/Cole.
5. Hettmansperger, T.P. (1984), *Statistical inference based on ranks*, New York: John Wiley.
6. Hettmansperger, T.P. and McKean, J.W. (1988), *Robust Nonparametric Statistical Methods*, Boca Raton, FL: CRC Press.
7. Shao, J. and Tu, D. (1995), *The Jackknife and Bootstrap*, New York: Springer.
8. Conover, W.J. (1999), *Practical Nonparametric Statistics*, New York: Wiley.

Course Goals: Be able to

1. select appropriate traditional nonparametric inferential methods, and apply them.
2. select and use appropriate emerging distribution–free methods.

Requirements:

HOMEWORK: Graded homework, constituting 30% of the final grade, will be assigned approximately biweekly. Solutions will be supplied. Students are encouraged to consult with each other and the instructor when contemplating these problems but are expected to draft their solutions themselves. Students who submit correct homework solutions without fully understanding them can expect substantially lower grades on exams. The lowest homework grade will be dropped. This provision is meant to accommodate personal emergencies, *and constitutes all such indulgence I expect to give in most cases*. Students are responsible for locating computing resources needed for homeworks. I expect (but do not require) that students will perform calculations using *R*.

EXAMS: Exams will be closed–book.

MIDTERM: in class, accounting for 30% of the final grade.

FINAL: Accounting for 40% of the final grade.

CLASSROOM PARTICIPATION: will not be explicitly graded. Students are responsible for any information and assignments discussed in class.
Prerequisites: Level IV statistics (960:401 or 484), and probability (960:580, 582, or 592).
Web Page: `http://www.stat.rutgers.edu/~kolassa/960-555`

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Projected Schedule and Syllabus

Wk	Day	Date		*Topics*	*Homework*	*Readings*
1	WE	7	Sep	Introduction to Nonparametrics, Review of Distributions and Objectives, One-sample median methods		§1
2	WE	14	Sep	One-Sample Nonparametric Methods		§2
3	WE	21	Sep	Two-Sample Nonparametric Methods: Definitions and a First View	HW-1 due	§3.1-3.5
4	WE	28	Sep	Two-Sample Nonparametric Methods: Efficiency, Power, and application to dispersion and distribution functions		3.6-3.11
5	WE	5	Oct	Nonparametric Methods for More than Two groups: Definitions and a First View	HW-2 due	§4.1-4.5
6	WE	12	Oct	Nonparametric Methods for More than Two groups: Power, Sample Size, and Efficiency		§4.6-4.8
7	WE	19	Oct	Block Designs	HW-3 due	§5.1-5.6
8	WE	26	Oct	Exam		
9	WE	2	Nov	Semi-parametric Correlation		§6.1-6.4
10	WE	9	Nov	Nonparametric Multivariate Analysis	HW-4 due	§7.1-7.5
11	WE	16	Nov	Density Estimation and Regression Function Estimation		§8.1-8.2, 9.1-9.6
12	WE	23	Nov	No Class		
13	WE	30	Nov	Univariate Boostrap	HW-5 due	10.1-10.2
14	WE	7	Dec	Multivariate Boostrap and the Jackknife		10.3-10.4
15	WE	14	Dec	Robustness	HW-6 due	MMY §3
16	WE	21	Dec	Exam		