Geography 360: Quantitative Methods in Geographical Analysis

Spring 2012

Lecture: Tuesday & Thursday 9:30-10:45 a.m.

Instructor: Karen Russ
418 Science Hall; kruss@wisc.edu
Office Hours: Tuesday 2:30-3:30, Friday 2:25-3:25, or by appointment

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This course will provide students with a basic understanding of standard statistical techniques by focusing on the application of descriptive and inferential statistics to geographic problems. We will also examine spatial data and the various statistical procedures developed specifically for this type of data. By the end of the semester, you will gain a familiarity with core statistical concepts and will be able to summarize and present geographic data, perform a variety of statistical tests, and critically assess quantitative analyses presented in your discipline.

Text: Burt, J.E., Barber, G.M., and D.L. Rigby, 2009. Elementary Statistics for Geographers, 3rd ed., Guilford Press, New York, N.Y. ISBN 978-1-57230-484-0 (hardcover)

You will also need a ***scientific calculator***, which you should bring to class.

Grading:

Exams		(3 x 100 pts=)	300 points	(3 x 20 % =) 60%
Lab:				
	Exercises	(12 x 10 pts=)	120 points	(12 x 2 % =) 24%
	Quizzes	(10 x 5 pts=)	50 points	(10 x 1 % =) 10%
	Participation		30 points	6%
Total			500 points	100%

Attendance: Attendance in lecture and lab is required. Your regular attendance and earnest participation is your ticket to help during our office hours. We will not give repeat lectures or lab presentations to students who skip class.

Exams: The exams each cover ~1/3 of the course material. The second and third exams address topics presented since shortly before the last exam; however, these topics will build on earlier material. If you must be out of town for an exam, please discuss this with the instructor as early as possible in the semester. If you miss an exam because of an emergency or health issue, notify the instructor as soon as possible, preferably within 24 hours. The instructor will determine whether the excuse is acceptable, and she may require documentation. Extra time for exams or other accommodations should be arranged through the McBurney Center.

Academic Dishonesty: We're against it. For the University policy on academic misconduct, see http://students.wisc.edu/saja/misconduct/UWS14.html .

TENTATIVE COURSE SCHEDULE

Week	Topics	Readings	Labs
1 (1/24 & 1/26)	Intro, measurement, evaluation, notation. Data display & measures of centrality	Ch 1: 3-8, 22-31 Ch 2: 39-62, 69-73, 79-92	
2 (1/31 & 2/2)	Measures of dispersion & shape Spatial data & potential problems	Ch 3: 95-118 Ch 3: 129-148	1. Census, boxplots, kurtosis, Systat
3 (2/7 & 2/9)	Associations (covariance, correlation...) Probability: vocab, postulates, rules…	Ch 4: 156-171 Ch 5: 201-210, 246-249	2. Descriptive stats, Spearman's r.c.c.
4 (2/14 & 2/16)	Random variables; discrete & continuous probability distributions; uniform distribution… Distributions: binomial, Poisson, normal, …	Ch 5: 210-222 Ch5: 222-238	3. Correlation; intro to probability
5 (2/21 & 2/23)	Z-scores and bivariate normal distribution	Ch 5: 236-246	4. Binomial, Poisson & uniform distributions…
6 (2/28 & 3/1)	***Exam 1*** Sampling; Central Limit Theorem	Ch 6: 254-257, 262-290	5. Normal distribution, z-scores, Central Limit thm
7 (3/6 & 3/8)	Finish sampling; go over exam. Point estimates and interval estimates	Ch 7: 293-309	6. Sampling
8 (3/13 & 3/15)	Finish interval estimates	Ch7: 309-318	7. Confidence intervals
9 (3/20 & 3/22)	One-sample hypothesis testing	Ch 8: all	8. More C.I.s
10 (3/27 & 3/29)	Two-sample hypothesis testing	Ch 9: all	9. Hypothesis testing: one-sample
	Spring Break!		
11 (4/10 & 4/12)	Finish 2-sample hypothesis tests; F-test. Start nonparametric methods: Sign test…	Ch 10: 376-393	10. Hypothesis testing: two-sample
12 (4/17 & 4/19)	***Exam 2*** More nonparametric: Mann-Whitney, chi-square, K-S tests, and maybe bootstrapping	Ch 10: 398-408, 418-428	11. F-test; Nonparametric: Sign test for the median
13 (4/24 & 4/26)	Go over exam, and then start regression. Regression analysis	Ch 4: 172-187 Ch 12: all	12. More non-parametric tests
14 (5/1 & 5/3)	Regression continued…		13. Regression analysis
15 (5/8 & 5/10)	Spatial statistics	Ch 14: 533-545 Ch 14: 549-559	14. Spatial stats

Exam 3: Thursday, May 17, 2:45-4:45, location to be determined.