

RUTGERS UNIVERSITY

QUANTITATIVE METHODS 830:200:10-13 SPRING 2019

LECTURE: Richard Weeks Hall 105 DAYS/TIMES: Tues & Thurs 6:40 – 8PM

RECITATION: See below for day/time/location your section will meet

Instructor: Dr. Stephen Kilianski

Office: Tillett Hall 225

Office Hours: Wed. 12 – 3 & by appt.

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RECITATION SECTIONS & TEACHING ASSISTANTS

10	Tues. 8:10 -9:30 PM	SEC 207	Steven Jones	sj534@psych.rutgers.edu
11	Wed. 5 – 6:20	SEC 208	Yarkin Mehmet Ergin	me441@scarletmail.rutgers.edu
12	Thur. 3:20 – 4:40	SEC 207	Caitlin Bronson	cab490@psych.rutgers.edu
13	Thur. 5 – 6:20	SEC 208	Caitlin Bronson	cab490@psych.rutgers.edu

Textbook: Basic Statistical Analysis (9th Edition). Sprinthall, R. C. (2012). Needham Hts., MA: Allyn & Bacon. *Note: You may find the older paperback “custom edition” at a low price. Page numbers and chapter numbers will differ and therefore may lead to confusion, although everything else is the same as the hardcover.* You will need the book for every recitation session and should bring it to lecture as well.

Goals: RELAX...you know all the math you need to know right now! If you can add, subtract, multiply, and divide, you can handle this course without any problem. Let go of your anxieties – in this course, they are your worst enemy. The subject matter is not difficult. The intent is to focus on what you need to know from a scientific perspective and to avoid the irrelevant and tangential. What you need to know I will make sure you understand very well. If you put in the effort, it is my mission to make sure that you succeed.

This course has been certified as satisfying both Quantitative and Formal Reasoning Learning Outcome Goals (QQ and QR) of the SAS Core Curriculum. Specifically, students will be able to:

- a) Formulate, evaluate, and communicate conclusions and inferences from quantitative information (QQ)
- b) Apply effective and efficient mathematical or other formal processes to reason and to solve problems

Course Requirements: Two (2) Hourly Exams. Each of these will consist of two parts administered separately during 2 consecutive lecture sessions. One part will be conceptual (no calculations, multiple-choice and T/F objective questions) worth 40 points; the other will be computational (calculating the appropriate statistics, determining whether or not to reject the null hypothesis, and describing results in layperson's terminology) worth 60 points. Except for the actual numbers, the structure and process involved in solving the computational problems will be identical to those used in class and in recitation. For the computational portion of the exam you will need your book and will be permitted to bring one 8.5 x 11 sheet of paper with any formulas or notes on it. Only calculators are permitted – no other electronic devices may be used. The conceptual and computational exams will be administered in the lecture hall. **The score on these two exams will account for approximately 58% of your grade (200 pts. – 100 pts. each).**

Comprehensive Final Exam. This will consist of two parts administered separately during the final exam session in the lecture hall. One part will be conceptual (no calculations, multiple-choice objective questions) worth 40 points; the other will be computational (calculating the appropriate statistics, determining whether or not to reject the null hypothesis, and describing results in layperson's terminology) worth 60 points. Except for the actual numbers, the structure and process involved in solving the computational problems will be identical to those used in class and in recitation. For the computational portion of the exam you will be permitted to bring two 8.5 x 11 sheet of paper with any formulas or notes on them. Only calculators are permitted – no other electronic devices may be used. **This score will account for approx. 27% of your grade (100 pts.).**

Classwork assignments. You will be doing many computational assignments in class during your recitation section. You will turn them in for credit. Obviously, if you're not there, you can't get the credit for in-class assignments. Recitations meet 10 times during the semester, so there are 10 of these assignments. "Forgiveness" will be granted for up to 3 missed classwork assignments (i.e., you will get credit for the ones you miss, but only 2 of them). **No make-up will be allowed for these assignments. These assignments account for approximately 15% of your grade (50 pts.).**

Extra Credit for Recitation Attendance/Classwork. You can earn an additional 5 points extra credit for *each* recitation attended beyond the 7 specified above. Therefore if you attend (and do the work for) all 10 recitations you would earn the 50 points for the first 7 and an additional 15 for the other 3.

Make-up Exams: In order to qualify for a make-up for the midterm or the final exam you must notify me ***in advance*** by telephone or email ***and*** provide documentation (i.e., an MD's note, an obituary or funeral notice, police report, etc.). If you don't meet **all** of these criteria, you will not be permitted to take a make-up.

Academic Integrity: Collusion (getting any form of assistance from other students or outside sources) on exams or the Sakai quizzes is prohibited. Students suspected of doing so will be brought up on charges before university's Office of Student Conduct, and penalties, up to and including expulsion, will be imposed for those found guilty. (See <http://policies.rutgers.edu/PDF/Section10/10.2.13-current.pdf> for specifics)

Attendance: Class attendance is not mandatory; however, since the in-class assignments during recitation constitute a large portion of your grade, and you cannot make them up if you miss them, you need to attend consistently. ***Missing lecture will render your conceptual understanding and procedural knowledge woefully deficient, so you should not skip those sessions either.***

Grading: Based on the total points you have accumulated on the 2 hourly exams (100 each), the final (100), the in-class recitation assignments (50) (a maximum of 350 total), and any extra credit earned, grades will be assigned as indicated below:

315-350 = A	262-279 = C+	< 210 = F
297-314 = B+	245-261 = C	
280-296 = B	210-244 = D	

THIS GRADING RUBRIC APPLIES TO ALL STUDENTS IN THIS CLASS – NO EXCEPTIONS FOR ANY REASON.

General Principle Please ask questions! It's the only reliable way we have of knowing whether you've understood what we're trying to convey. Even if you can't articulate what it is you don't understand, just say "I have no idea what you're talking about," or, "I'm lost," or "Help!" Chances are that if you don't get it, there are a number of your classmates who are also floundering. Help everyone out by asking, please!

Materials A simple electronic calculator is all you need. They cost as little as \$3 - \$5.

Bring your book and calculator to every recitation session – you will need them! It is also recommended that you bring your textbook to every lecture, as I will often be referring to specific tables or examples in the text.

CLASS CALENDAR
QUANTITATIVE METHODS 830:200:10 - 13 SPRING 2019

NOTE: Chapters/pages for text in red are for the paperback version of the text which is NOT recommended. Those in black are for the hardcover version, which is what the TAs and I will be working from.

DATE	TEXT CHAPTERS	TOPICS & EVENTS	SAKAI QUIZ
Tues 1/22		Orientation and review of syllabus and resources available.	No recitation sessions this week
Thurs 1/24	Chapter 1 Chapter 9 (pp. 198-208) Ch 7 (pp. 166-179)	Types of measurement – nominal, ordinal, interval, ratio. Independent vs. dependent variables. Descriptive vs. Inferential Statistics: Drawing conclusions about populations from sample data.	No recitation sessions this week
Tues 1/29	Chapter 2 (pp. 25-46) pp. 32-49 Chapter 3 (pp. 54-59; 61-66) pp 58-63 and 65-70	Measures of central tendency – mean, median, mode. Graphing frequency distributions. Measures of variability – range, variance, and standard deviation. Kurtosis and skew.	Recitation 1
Thurs 1/31	Chapter 4	Characteristics of the normal distribution and the use of z-scores.	
Tues 2/5	Chapter 4 (cont'd) Ch. 7 (pp. 156-160) Ch. 5 (pp. 120-124)	Characteristics of the normal distribution and the use of z-scores (cont'd). The Sampling Distribution of the Mean and its characteristics (Central Limit Theorem).	Recitation 2
Thurs 2/7 & Tues 2/12	Chapters 6 and 7(pp. 144-151; 156-167) Chapter 5 pp.108-110; 120-129	The Z-test (inference regarding population means) and confidence intervals (for estimating population means). Null and alternative hypotheses. Alpha levels and statistical significance.	Recitation 3

Thurs. 2/14	Chapter 8 (pp. 170-173; (ignore p. 174); 175-193) Chapter 6 pp. 136-137; 141-159	The t-test – Testing for mean differences. Single-sample t-test. Inferences about populations from samples.	
Tues 2/19	Chapter 10 (ignore p. 253) Chapter 8 pp. 215-222; pp. 224-233; pp. 235-250.	The Sampling Distribution of the Difference and the independent samples t-test. The use of 1- vs. 2-tailed t-tables.	Recitation 4
Thurs. 2/21	Review Ch 8 and 10 concepts and calculations	Computing CI for mean difference Using Xcel to calculate M and SD Ind. Samples t review	
Tues. 2/26	Chapter 13 (pp. 374-385, 395) Chapter 11 pp.350-361; 37-371	Nominal data and the chi-square test	Recitation 5
Thurs. 2/28	Review for Midterm Exam	Covers all material up to and including 2/23. If we are behind, we will catch up here	
Tues. 3/5	HOURLY EXAM 1 CONCEPTUAL	RECITATION SECTIONS DO NOT MEET THIS WEEK	IN LECTURE HALL
Thurs 3/7	HOURLY EXAM 1 COMPUTATIONAL	RECITATION SECTIONS DO NOT MEET THIS WEEK	IN LECTURE HALL – BRING YOUR TEXT & CALCULATOR
Tues. 3/12	Chapter 11 (pp. 287-296; skip bottom of 296 to 300; 300-306; 310-311 Chapter 9 pp. 259-268; 272-278; p.282.	The Correlation Coefficient: Pearson's r Fisher's Z test for difference between two Pearson's r values	Recitation 6
Thurs. 3/14	Chapter 15 (pp.447-453) Chapter 13 pp.425-440	Repeated-measures (within-subjects) t-tests.	

Tues. 3/26	Chapter 12 (pp. 330-350) (ignore Steps 1-4 on p. 342 for calculation of 1-Way F Chapter 10 pp. 304-324)	The 1-way Analysis of Variance – Testing for mean differences among more than 2 groups. Post-hoc testing (Tukey test).	Recitation 7
Thurs. 3/28	Chapter 12 (Factorial ANOVA) pp. 350-360; 363-365 Chapter 10 pp. 324-338	Factorial ANOVA – Testing for the effects of more than 1 independent variable on a dependent variable. Main effects and interactions.	
Tues. 4/2	Chapter 12 (Factorial ANOVA) Continued.	Factorial ANOVA – Continued	Recitation 8
Thurs. 4/4	Review for hourly exam 2	.	
Tues. 4/9	HOURLY EXAM 2 CONCEPTUAL	RECITATION SECTIONS DO NOT MEET THIS WEEK	IN LECTURE HALL
Thurs 4/11	HOURLY EXAM 2 COMPUTATIONAL	RECITATION SECTIONS DO NOT MEET THIS WEEK	IN LECTURE HALL – BRING YOUR TEXT & CALCULATOR
Tues. 4/16	Chapter 14 Ch 12 pp. 382-395	Linear Regression Analysis: Predicting values on a criterion using a predictor and the regression equation.	Recitation 9
Thurs. 4/18	Chapter 14 pp. 404-414; 421-428 Ch 12 pp. 399-410	Multiple Regression Analysis: Predicting values on a criterion using a set of many predictor variables	
Tues 4/23		Multiple Regression Analysis (cont'd)	Recitation 10

Thurs 4/23	Review – Basics of inferential statistics	Null hypothesis, alpha levels, t-tests, direction and non-directional hypotheses, chi-square test	
Tues. 4/28	Review – Additional inferential statistics	Pearson's r, within-Ss t-test, 1-way ANOVA and post hoc testing	
Thurs 5/2	Review – Multivariate inferential statistics	Factorial ANOVA and the principle of interactions. Linear and multiple regression analysis.	
Thurs. 5/9 8-11 PM	FINAL EXAM LOCATION: WEEKS HALL (BUSCH)	This is a comprehensive final assessing all concepts and procedures that have been covered throughout the entire semester	

Academic Accommodations: Should you require academic accommodations, you must file a request with the Office of Disability Services (Office of Disability Services-New Brunswick, Lucy Stone Hall, Suite A145, Livingston Campus, 848-445-6800). It is your responsibility to self-identify with the Office of Disability Services and to provide me with the appropriate documentation from that office at least one week prior to any request for specific testing accommodations.