RUTGERS UNIVERSITY

QUANTITATIVE METHODS 830:200:10-13   SPRING 2016
LECTURE: Hill Center 114   **DAYS/TIMES**: Tues & Thurs 6:40 – 8:00 PM
RECITATION: See below for day/time/location your section will meet

Instructor: Dr. Stephen Kilianski
Office: Tillett Hall 225   Dept. Office Phone (848) 445-4036
Office Hours: T/Th 1 – 4pm; M/W by appt. Email: skilians@rci.rutgers.edu

RECITATION SECTIONS & TEACHING ASSISTANTS

10	T 8:10-9:30pm	SEC 207	Efe Soyman	es601@scarletmail.rutgers.edu
11	W 5:00-6:20pm	SEC 208	Jihye Ryu	jr1102@scarletmail.rutgers.edu
12	Th 3:20-4:40pm	BE 250	Efe Soyman	es601@scarletmail.rutgers.edu
13	Th 5:00-6:20pm	SEC210	Jihye Ryu	jr1102@scarletmail.rutgers.edu

Textbook: **Basic Statistical Analysis (9th Edition)**. Sprinthall, R. C. (2012). Needham Hts., MA: Allyn & Bacon. *Note: Do not purchase an earlier edition. Page numbers and problems differ and the consequences will be disastrous.* You will need the book for every recitation session and should bring it to lecture as well. A custom paperback edition with unnecessary chapters omitted is being sold by the bookstore.

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. 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 objective questions); 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). Except for the actual numbers, the structure and process involved in solving the computational problems will be identical to those used in class. 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); 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). Except for the actual numbers, the structure and process involved in solving the computational problems will be identical to those used in class. For the computational portion of the exam you 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 **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 2 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 Sakai Quizzes. There will be 3 on-line quizzes made available on Sakai at specific points in the semester (see class calendar below). You need to use a computer with access to the web to take these quizzes. These are extra credit – not required, but recommended.

Each quiz will consist of 20 multiple-choice and true/false questions, and will be available and must be completed only during the designated time period. **They cannot be made up if you miss them**. **You can earn up to 30 pts. by getting correct answers on these quizzes (1/2 pt for each correct answer).**

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 explusion, 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 put your conceptual understanding and procedural knowledge in jeopardy, 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 the points earned on the extra credit quizzes (a maximum of 30), 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.

A computer (with internet access) is necessary to take the Sakai quizzes, but this is done outside of class.

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.

Academic Integrity: Collusion (getting any form of assistance from other students or outside sources) on exams, including online exams, is prohibited. Students suspected of doing so will be brought up on charges before the 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.)

CLASS CALENDAR
QUANTITATIVE METHODS 830:200:10-13   SPRING 2016

NOTE: Chapters/pages for text in red are for the custom, paperback version of the text. Those in black are for the hardcover version.

DATE	TEXT CHAPTERS	TOPICS & EVENTS	SAKAI QUIZ
Tues. 1/19		Orientation and review of syllabus and resources available.	**No recitation sessions this week**
Thurs. 1/21	Chapter 1 Chapter 9 (pp. 198-208) Ch 7 (pp. 166-179) Chapter 2 (pp. 25-46) pp. 32-49	Types of measurement – nominal, ordinal, interval, ratio. Independent vs. dependent variables. Issues in scientific measurement: Reliability and validity Measures of central tendency – mean, median, mode. Graphing frequency distributions.	**No recitation sessions this week**
Tues 1/26	Chapter 3 (pp. 54-59; 61-66) pp 58-63 and 65-70	Measures of variability – range, variance, and standard deviation. Kurtosis and skew.	**Recitation 1**
Thurs 1/28	Chapter 4	Characteristics of the normal distribution and the use of z-scores. .	
Tues 2/2	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 2/4 & Tues 2/9	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).	**Recitation 3**

Thurs. 2/11	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. Null and alternative hypotheses. Alpha levels and statistical significance.	
Tues 2/16	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. 2/18	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. 2/23	Chapter 13 (pp. 374-385, 395) Chapter 11 pp.350-361; 37-371	Nominal data and the chi-square test	**Recitation 5**
Thurs. 2/25	**Review for Midterm Exam**	Covers all material up to and including 2/23. If we are behind, we will catch up here	**Quiz 1 available from 2/26 to 2/29 15 min. time limit – can be taken only once.**
Tues. 3/1	**HOURLY EXAM 1 CONCEPTUAL**	**RECITATION SECTIONS DO NOT MEET THIS WEEK**	**IN LECTURE HALL**
Thurs 3/3	**HOURLY EXAM 1 COMPUTATIONAL**	**RECITATION SECTIONS DO NOT MEET THIS WEEK**	**IN LECTURE HALL – BRING YOUR TEXT & CALCULATOR**
Tues. 3/8	Chapter 11 (pp. 287-296; skip bottom of 296 to 300; 300-306; skip 307-309; 310-311 Chapter 9 pp. 259-268; 272-278; p.282.	The Correlation Coefficient: Pearson's r	**Recitation 6**
Thurs. 3/10	Chapter 15 (pp.447-453) Chapter 13 pp.425-440	Repeated-measures (within-subjects) t-tests.	

Tues. 3/22	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. 3/24	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. 3/29	Chapter 12 (Factorial ANOVA) Continued.	Factorial ANOVA – Continued	**Recitation 8**
Thurs. 3/31	Review for hourly exam 2	.	**Quiz 2 available from 3/30 to 4/4 15 min. time limit – can be taken only once.**
Tues. 4/5	**HOURLY EXAM 2 CONCEPTUAL**	**RECITATION SECTIONS DO NOT MEET THIS WEEK**	**IN LECTURE HALL**
Thurs 4/7	**HOURLY EXAM 2 COMPUTATIONAL**	**RECITATION SECTIONS DO NOT MEET THIS WEEK**	**IN LECTURE HALL – BRING YOUR TEXT & CALCULATOR**
Tues. 4/12	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. 4/14	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	**Recitation 10**
Tues. 4/19		Multiple Regression Analysis (cont'd)	**Quiz 3 available from 4/20 to 4/28. 15 min. time limit. Can be taken only once.**

Thurs 4/21	Review – Basics of inferential statistics	Null hypothesis, alpha levels, t-tests, direction and non-directional hypotheses, chi-square test	
Tues. 4/26	Review – Additional inferential statistics	Pearson's r, within-Ss t-test, 1-way ANOVA and post hoc testing	
Thurs 4/28	Review – Multivariate inferential statistics	Factorial ANOVA and the principle of interactions. Linear and multiple regression analysis.	
Tues 5/5	**FINAL EXAM 8-11pm LOCATION: HILL 114**	This is a comprehensive final assessing all topics 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 (Kreeger Learning Center 151 College Avenue, Suite 123, disabilityservices.rutgers.edu). 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.**