

**RUTGERS UNIVERSITY**

**QUANTITATIVE METHODS 830:200:10-13 Spring 2014**

**LECTURE:** Hill Center 114 **DAYS/TIMES:** Tues & Thurs 6:40 – 8:00PM

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

Instructor: Dr. Stephen Kilianski

Office: Tillett Hall 225

Office Hours: T/Th 3-5; M/W 11-1

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**RECITATION SECTIONS & TEACHING ASSISTANTS**

**10 Tues 8:10-9:30pm SEC 207 Sara Norton san103@scarletmail.rutgers.edu**

**11 Wed 5:00-6:20pm SEC 208 Sara Norton san103@scarletmail.rutgers.edu**

**12 Th 3:20-4:40pm LCB 109 Janell Fetterolf j.fetterolf@gmail.com**

**13 Th 5:00-6:20pm SEC 210 Janell Fetterolf j.fetterolf@gmail.com**

**Textbook:** Basic Statistical Analysis (9<sup>th</sup> 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.* The bookstore will be selling a paperback edition with unnecessary chapters omitted for a reduced price. **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. 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 computational exams will be administered in the lecture hall. The conceptual exams will be administered online via Sakai and more information will be provided as the exam date approaches. **The score on these two exams will account for 40% 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 40% of your grade (200 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 20% of your grade (100 pts.).**

***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 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 (200), the in-class recitation assignments (100) (a maximum of 500 total), grades will be assigned as indicated below:

450-500 = A	375-399 = C+	< 300 = F
425-449 = B+	350-374 = C	
400-424 = B	300-349 = 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 both 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 2014**

DATE	TEXT READINGS*	TOPICS & EVENTS	RECITATIONS
Tues. 1/21		Orientation and review of syllabus and resources available.	<b>No recitation sessions this week</b>
Thurs. 1/23	Chapter 1 Ch 7 (pp. 166-179) Ch 9 (pp. 198-208)	Types of measurement – nominal, ordinal, interval, ratio. Independent vs. dependent variables. Issues in scientific measurement: Reliability and validity	<b>No recitation sessions this week</b>
Tues 1/28 Thurs 1/30	Chapter 2 pp. 32-49 (pp. 32-46)  Chapter 3 pp 58-63 and 65-70 (pp. 54-59; 61-66)	Measures of central tendency – mean, median, mode. Graphing frequency distributions. Measure of variability – range, variance, and standard deviation. Kurtosis and skew.	<b>Recitation Week 1</b>
Tues 2/4	Chapter 4	Characteristics of the normal distribution and the use of z-scores.	<b>Recitation Week 2</b>
Thurs 2/6 Tues 2/11	Chapter 5 pp.108-110; 120-129 Chapter 7(pp. 144-151; 156-167)	Fundamental Principles. The Sampling Distribution of the Mean and its characteristics. The Z-test (testing directional and non-directional hypotheses) and confidence intervals.	<b>Recitation Week 3</b>
Tues 2/11	Chapter 6 pp. 136-137; 141-159 Chapter 8 (pp. 170- 173; (ignore p. 174); 175-193)	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. Confidence intervals with t-values.	<b>Recitation Week 3</b>
Thurs. 2/13 Tues 2/18	Chapter 8 pp. 215-222; pp. 224-233; pp. 235- 250. Chapter 10 (ignore p. 253)	The Sampling Distribution of the Difference and the independent samples t-test. The use of 1- vs. 2-tailed t-tables.	<b>Recitation Week 4</b>
Thurs. 2/20	Review Ch 6 and 8 concepts and calculations	When do we use the single-sample t vs. the independent samples t-test? When do we use the 1 vs. 2 tailed test? Sampling dist of difference vs. sampling dist of mean.	<b>Recitation Week 5</b>
Tues.	Chapter 11 pp.350-361;	Nominal data and the chi-square test	

2/25	37-371 Chapter 13 (pp. 374-385, 395)		<b>Recitation Week 5</b>
Thurs. 2/27	<b>Review for Midterm Exam</b>	Covers all material up to and including 2/25. If we are behind, we will catch up here	
Tues. 3/4	<b>HOURLY EXAM 1 COMPUTATIONAL</b>	<b>IN LECTURE HALL. TEXT AND CALCULATOR ARE REQUIRED</b>	<b>No recitations this week</b>
Thurs 3/6	<b>HOURLY EXAM 1 CONCEPTUAL</b>	<b>ON SAKAI. EXAM OPENS 6:40 CLOSSES 8:00. TIME LIMIT IS 60 MIN.</b>	<b>No recitations this week</b>
Tues. 3/11	Chapter 9 pp. 259-268; 272-278; p.282. Chapter 11 (pp. 287-296; skip bottom of 296 to 300; 300-306; skip 307-309; 310-311)	The Correlation Coefficient: Pearson's $r$	<b>Recitation Week 6</b>
Thurs. 3/13	Chapter 13 pp.425-440 Chapter 15 (pp.447-453)	Repeated-measures (within-subjects) t-tests.	<b>Recitation Week 7</b>
Tues & Thurs. 3/18 & 3/20	<b>NO CLASSES – SPRING RECESS</b>		
Tues. 3/25	Chapter 10 pp. 304-324 Chapter 12 (pp. 330-350)	The 1-way Analysis of Variance – Testing for mean differences among more than 2 groups. Post-hoc testing (Tukey test).	<b>Recitation Week 7</b>
Thurs. 3/27	Chapter 10 pp. 324-338 Chapter 12 pp. 350-360; 363-365	Factorial ANOVA – Testing for the effects of more than 1 independent variable on a dependent variable. Main effects and interactions.	<b>Recitation Week 8</b>
Tues. 4/1	FACTORIAL ANOVA Continued.	Factorial ANOVA – Continued	<b>Recitation Week 8</b>
Thurs. 4/3	Review for hourly exam 2	.	

Tues. 4/8	<b>HOURLY EXAM 2 COMPUTATIONAL</b>	<b>IN LECTURE HALL. TEXT AND CALCULATOR ARE REQUIRED</b>	<b>NO RECITATIONS THIS WEEK</b>
Thurs 4/10	<b>HOURLY EXAM 2 CONCEPTUAL</b>	<b>ON SAKAI. EXAM OPENS 6:40 CLOSES 8:00. TIME LIMIT IS 60 MIN.</b>	<b>NO RECITATIONS THIS WEEK</b>
Tues. 4/15	Ch 12 pp. 382-395 <b>Ch 14 pp.404-417</b>	Linear Regression Analysis: Predicting values on a criterion using a predictor and the regression equation.	<b>Recitation Week 9</b>
Thurs. 4/17	Ch 12 pp. 399-410 <b>Ch 14 pp. 421-432</b>	Multiple Regression Analysis: Predicting values on a criterion using a set of many predictor variables	<b>Recitation Week 10</b>
Tues. 4/22		Topics to be announced. If we are behind, we will catch up here. Otherwise, this session may be skipped	
Thurs. 4/24	Review – Basics of inferential statistics	Null hypothesis, alpha levels, t-tests, direction and non-directional hypotheses, chi-square test	
Tues.. 4/29	Review – Additional inferential statistics	Pearson's r, within-Ss t-test, 1-way ANOVA and post hoc testing	
Thurs. 5/1	Review – Multivariate inferential statistics	Factorial ANOVA and the principle of interactions. Linear and multiple regression analysis.	
Thurs. 5/8	<b>FINAL EXAM 8-11pm LOCATION: Hill Center 114</b>	This is a comprehensive final assessing all topics that have been covered throughout the entire semester	

\*Reading assignments in **RED** are the corresponding chapters and page numbers in the non-customized, hard cover edition of the text.

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**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](http://kreegerlearningcenter151.collegeavenue.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.