



Quantitative Methods – Summer 2019

830:200: H2, 4 Credits

(This syllabus has been amended from Spring 2019 syllabus prepared by Dr. Stephen Kilianski for 830:200 Quantitative Methods)

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Office Hours: Tuesdays: 12:30 PM - 1:30 PM, by appointment, or if you can catch me in my office. Email appointment is preferred option (you should email me before coming to my office to ensure I'll be around, I have other obligations to attend to outside of this class).

Time: Monday through Thursday: 2:00 – 4:30 PM

Location: SEC 202

Dates: 07/08 – 08/14

****Disclaimer**:**

Everything in this syllabus is subject to change at my discretion. You will be informed if such changes are made.

Textbook:

Sprinthall, R.C. (2012). *Basic Statistical Analysis (9th Edition)*, 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 lecture **and** exam.*

Assigned Reading (VERY important!)

You are expected to complete the assigned reading for the day **BEFORE** you come to class. Remember that this is a course with an accelerated pace relative to spring and fall semester courses. That means that you are expected to bare the responsibility for being prepared for that day's lecture through reading beforehand, it will give you the fundamental ideas of what we will be doing that day and during lecture we can focus on the details. ***I am lecturing with the assumption that everyone has completed the assigned readings for that day; if you don't read, you will very likely be lost!*** You are **not** responsible for sections of the chapters titled "Spotlight on SPSS" or "For Excel Users."

Description:

Despite what you may have heard about this course, you should not approach it like a math course (afterall, you are taking a **PSYCHOLOGY** course). This is a course in which understanding data is the overall goal. To do this, we *will* use math, but you know all of the math you need to know before we even begin (addition, subtraction, multiplication, division, exponents, and square roots). Those who attempt this class with this understanding will likely find great success. Let go of your worries and anxieties about calculations and above all else focus on just understanding the data -- that is the goal of using statistics, afterall.

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:

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

Course Requirements:

Two Midterm Exams (50% of total course grade: 25% each)

Each of these will consist of two parts administered separately. 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). For the computational portion of the exams 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 on the computational portion. You may **not** use graphing calculators or other calculators that can store equations. Tentative exam dates are **Thursday, 7/18** and **Thursday, 8/1**.

Comprehensive Final Exam (35% of total course grade)

This will be similar in structure to the unit exams (so, part will be conceptual multiple choice and part will be computational), but any and all material covered throughout the whole course will be fair game. Tentative final exam date is **Wednesday, 8/14**.

In-class Assignments (15% of total course grade: 5 assignments worth 3% each)

Throughout the semester I will be giving in-class assignments (computational problems) that I will assign without prior warning that need to be done and handed in by the end of class. Obviously, if you're not present you cannot get credit for these. If you are in class and paying attention, these will be easy points! I'm assigning these to ensure that you are practicing the computational problems (so you won't be blindsided on the exams) and to ensure you're paying attention during lectures. They will be fully open-book, open-note, and I will be available for questions.

Course Point Breakdown:

Exam I (25%)

Exam II (25%)

Comprehensive Final Exam (35%)

In-class assignments (15%)

Grading:

Final grades will be assigned using the following scale:

- A: 90.0 -100.0%
- B+: 85.0-89.99%
- B: 80.0-84.99%
- C+: 75-79.99%
- C: 70-74.99%
- D: 60.0 - 69.99%
- F: 0.0 - 59.99%

Because of an increasing tendency of students to try to persuade me to change their grade after the semester is over, let me be very explicit: I will give anyone as much help as they need to prepare for tests during the semester. If you need to get extra help, or want to do "extra" work (i.e., prepare more, think more, study harder, talk to me more...), the time to do so is during the semester. **There will be absolutely no "extra credit" offered** outside of your exams and the in-class assignments. During your exams and in-class assignments are the times to earn all the credit you can. Please do not send me an email asking me to round your grade or give you points, either. Neither NASA nor your bank will "round up" just to achieve a more favorable outcome, and neither will I.

Attendance:

Everyone taking this class is an adult. As such, attending lecture is your choice. I will not be taking attendance. That being said, it's hard to imagine how anyone could succeed without attending the lectures. ***The vast majority of content on the exams will come from my lectures, not the textbook.*** I will also be giving in-class assignments that (obviously) you can only do if you are at lecture. ***There will be no make-up assignments available for the in-class assignments. If you do not attend class and you miss one, you have lost the points.***

Everyone who comes to class, is paying attention, and actively engages with me and the material should do well in this class. If you don't come to class, or if you sleep in class, or if you text your friends while in class, or if you play on Facebook while in class, you will probably do poorly. If you don't want to come to class, it is probably best not to take this (or any) course (why are you in college?). If you don't come, you should feel very uncomfortable using anyone else's notes as a substitute for coming to class. The material of this course needs to be explained and will be difficult to grasp from reading alone (especially from someone else's notes). The bottom line is, if you make that little effort to come to class and to pay attention while you are here, you will learn a lot and get a good grade. I also happen to think that the material is interesting. On a final note, I will be posting my PowerPoint slides for the semester. They are **NOT** a substitute for attendance. Believe me, you will **NOT** understand them if you don't come to class!

Academic Integrity:

Each student in this course is expected to abide by the Rutgers University Code of Student Conduct and Academic Integrity Policy. Any work submitted by a student in this course for academic credit will be the student's own work. Penalty for violation of the University Code of Student Conduct can also be extended to include failure of the course and University disciplinary action. The risk really isn't worth it.

During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. It will be very obvious to me if you are doing your own work or not. You are expected to show all of your work on all computational problems. Any collaborative behavior during the examinations **will** result in failure of the exam, and may lead to failure of the course and University disciplinary action. In short: do not cheat! Do not plagiarize! Visit <http://academicintegrity.rutgers.edu/resources-for-students> for info and useful links.

Accommodations:

Appropriate accommodations are available for students with disabilities. In compliance with the Rutgers University policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for

academic accommodations are to be made during the first week of the semester, unless for unusual circumstances, so arrangements can be made. Students are encouraged to register with the Office of Disability Services to verify eligibility for appropriate accommodations and to provide me with documentation. Please see web site of the Office of Disability Services for Students (<https://ods.rutgers.edu/>) for more information.

General Principle:

Please ask questions! It's the only reliable way I have of knowing whether you've understood what I'm 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, but I can't read your minds (I promise). Help everyone out (including me) by asking, please!

Materials:

A simple electronic calculator is necessary and sufficient for the course. They cost as little as \$3 - \$5. Bring your book, a calculator, as well as something to write with and on to every lecture -- you will need them!

Class Schedule (tentative; subject to change)

NOTE: Chapters/pages for text in blue are for the paperback version of the text.

Week	Date	Text Readings	Topics/Events
1	Mon. 7/8	<ul style="list-style-type: none"> - Chapter 1 - Chapter 9 (pp. 198- 208) - Ch 7 (pp. 166-179) - Chapter 2 (pp. 25-46) pp. 32-49 	<ul style="list-style-type: none"> - Orientation - syllabus review - Types of measurement - nominal, ordinal, interval/ratio - Independent v. dependent variables - Issue in scientific measurement: reliability and validity - Measures of central tendency - mean, median, mode, range - Graphing frequency distributions
	Tues. 7/9	<ul style="list-style-type: none"> - Chapter 3 (pp. 54-59; 61-66) pp 58-63 and 65-70 - Chapter 4 - Ch. 7 (pp. 156-160) - Ch. 5 (pp. 120-124) 	<ul style="list-style-type: none"> - Measures of variability - range, variance, and standard deviation. - Kurtosis and skew - Characteristics of the normal distribution and the use of z-scores - Sampling distribution of the mean - Central Limit Theorem
	Wed. 7/10	<ul style="list-style-type: none"> - Chapters 6 and 7(pp. 144-151; 156-167) - Chapter 5 pp.108-110; 120- 129 	<ul style="list-style-type: none"> - Null and alternative hypotheses - The Z-test and confidence intervals - Alpha level and statistical significance
	Thurs. 7/11	<ul style="list-style-type: none"> - Chapter 8 (pp. 170-173; (ignore p. 174); 175-193) - Chapter 6 pp. 136-137; 141-159 - Chapter 10 (ignore p. 253) - Chapter 8 pp. 215-222; pp. 224-233; pp. 235-250. 	<ul style="list-style-type: none"> - Single-sample t-test - Inferences about populations from samples - Sampling distribution of the difference - Independent samples t-test
2	Mon. 7/15	<ul style="list-style-type: none"> - Chapter 10 (ignore p. 253) - Chapter 8 pp. 215-222; pp. 224-233; pp. 235-250. 	Independent samples t-test (continued)
	Tues. 7/16	N/A	Review for Exam I
	Wed. 7/17	N/A	Review for Exam I
	Thurs. 7/18	EXAM I	EXAM I

3	Mon. 7/22	<ul style="list-style-type: none"> - Chapter 13 (pp. 374-385, 395) - Chapter 11 pp. 350-361; 37-371 	Nominal data and the chi-squared test
	Tue. 7/23	<ul style="list-style-type: none"> - Chapter 11 (pp. 287-296; skip bottom of 296 to 300; 300-306; 310-311) - Chapter 9 pp. 259-268; 272-278; p.282 - Chapter 15 (pp.447-453) - Chapter 13 pp.425-440 	Correlations <ul style="list-style-type: none"> - Pearson's R Repeated-measures (within-subjects) t-test
	Wed. 7/24	<ul style="list-style-type: none"> - Chapter 15 (pp.447-453) - Chapter 13 pp.425-440 	Repeated-measures (within-subjects) t-test
	Thurs. 7/25	<ul style="list-style-type: none"> - Chapter 12 (pp. 330-350) (ignore steps 1-4 on p. 342 for calculation of 1-Way F) - Chapter 10 pp. 304-324 	One-way ANOVA <ul style="list-style-type: none"> - Testing for differences among more than two groups. Tukey's post-hoc test
4	Mon. 7/29	- Same as last week	One-way ANOVA (continued)
	Tues. 7/30	N/A	Review for Exam II
	Wed. 7/31	N/A	Review for Exam II
	Thurs. 8/1	EXAM II	EXAM II

5	Mon. 8/5	<ul style="list-style-type: none"> - 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. 8/6	- Same as last week	Factorial ANOVA (continued)
	Wed. 8/7	<ul style="list-style-type: none"> - Chapter 14 - Ch 12 pp. 382-395 	Linear Regression Analysis: Predicting values on a criterion using a predictor and the regression equation.
	Thurs. 8/8	N/A	Review for final exam - Exam I material
6	Mon. 8/12	N/A	Review for final exam - Exam II material
	Tues. 8/13	N/A	Review for final exam - New material
	Wed. 8/14	FINAL EXAM	FINAL EXAM