

Fall 2011

01:830:200 – Quantitative Methods in Psychology

- Sections 03 – 06: Lecture: Tuesdays and Thursdays, 1:40 - 3:00 PM, Beck Aud

Recitations:

- Section 03: Tuesdays, 3:20 - 4:40 PM, TIL 204
- Section 04: Wednesdays, 10:20 - 11:40 AM, Beck 253
- Section 05: Wednesdays, 12:00 - 1:20 PM, Beck 253
- Section 06: Wednesdays, 1:40 - 3:00 PM, LSH B267

- Sections 11 – 14: Lecture: Tuesdays and Thursdays, 6:40 - 8:00 PM, LSH AUD

Recitations:

- Section 11: Wednesdays, 3:20 - 4:40 PM, LSH B267
- Section 12: Thursdays, 3:20 - 4:40 PM, LCB 110
- Section 13: Thursdays, 5:00 - 6:20 PM, LCB 110
- Section 14: Tuesdays, 8:10 - 9:30 PM, LCB 103

Instructor:

Dr. John Ackroff

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Tillett 223

Office Hours: Wednesdays, 3:30 – 4:30, and by appointment

Textbook:

Karlin, Robert. A.. *Behavioral Statistics in Simple English.*, 5th Edition, Revision 1.

Available at New Jersey Books, 37 Easton Avenue, New Brunswick. A limited number are available at the Rutgers Bookstore.

About Quantitative Methods – Course Goals:

Many people think Quantitative Methods is a course intended to make their lives difficult. In fact, the principles and techniques you will learn in this course can improve your life. We will talk about how to interpret and understand various forms of data and claims that are made about what those data mean. While the purpose of this course is to teach you how to analyze data you may gather and interpret data that are

presented in the psychological literature, you will also see how you can apply the information discussed in the course to situations outside the classroom.

The course is structured to give you several presentations of each concept in a variety of formats. For each topic, you will read the book, hear it described and explained in lecture, do the Computational Practice Exercises, go over them (and similar problems) in your recitation section, answer questions on the Online Exam, have a second discussion in a review session in lecture, and have the opportunity to review the book, your notes, Computational Practice Exercises, and Online Exams as you study for the exams in class. As psychologists, we know that providing multiple exposures spread over time leads to better and longer-lasting learning than a single intensive (e.g. cramming) exposure. All this may seem like it is a lot of work, and repetitive. But this is done by design, and if you stick with the program, you should finish the course with a good grasp of the material.

Grading:

You are expected to comply with Rutgers' [Academic Integrity Policy](#).

- **Exams:** There will be three exams based on the text and other materials presented in class. You are responsible for bringing pencils with erasers to each exam. Exam scores will be posted in the SAS Gradebook. If you have questions about your score on an exam, you must discuss it with your Teaching Assistant before the next exam.

Each exam is given in two parts: a conceptual part, consisting of multiple choice and/or essay questions, and a computational part. You will be given a formula sheet and tables for the computational part. You may not use any electronic device other than your calculator. You may **not** use your cell phone calculator. You must bring your Rutgers ID card to the exam.

Use of any electronic device other than a calculator will be considered an attempt to cheat on the exam. You will receive a 0 for that exam; other disciplinary measures may also be taken.

The first two exams are given in two parts: the conceptual part is given during one regular class meeting, and the computational part will be given during the following class meeting.

The conceptual and computational parts of the final are given during the regularly scheduled final exam periods, shown on the schedule below.

Please do not bring any materials that you will not need during the exam. Any large backpacks, etc., must be left at the front of the room. Everything you bring must fit under your seat. Anything that does not must also be left at the front of the room.

For the computational part of the exam, you must show your work. If you write down the correct answer, but don't show how you arrived at it, you will receive no points. If you set up the problem correctly and make a minor computational error, you will receive most of the credit for the problem. Each error reduces your score. If your answer is obviously incorrect (for example, you compute the mean of 3, 5, and 7 to be 86), you will receive less credit.

For the computational exam, you will be given formula sheets with the relevant formulae from the inside front and back covers of the text, as well as any necessary tables. The midterm exam is worth 250 points, the ANOVA exam is worth 200, and the final, which is cumulative, is worth 440 points. So

890 points in the course are available through the exams.

If you have a schedule conflict with an exam, you may be allowed to make up the exam at the discretion of the instructor. If you miss an exam, you will be allowed to take a make-up exam only if you provide documentation for a valid reason for missing the exam. For absences due to colds, etc., a note from your Health Center or doctor will be acceptable. For more serious issues such as a death in the family or serious health or personal issues, you may present a note from your Dean's office verifying that you missed the exam due to an excused absence. This note should also indicate a reasonable time frame in which you will be able to make up the exam. You should give this note to the instructor within 1 week of your return to class.

Exams are often given in a different location in order to allow for more room between students. Room changes will be posted on the class web page. If an exam is cancelled or postponed on the day of the exam, there will be a member of the Psychology Department in the room at the scheduled time to make the announcement. Notices posted on doors or the blackboard are likely to be hoaxes.

- **Computational Practice Exercises:** Each chapter contains several sets of Computational Practice Exercises (CPE). The questions are in each chapter, set off from the text by rows of asterisks. The answers are in the back of the book.

CPE are due in at the beginning of recitation sections according to the schedule on the course web page, and reprinted below. CPE **must** be turned in at the beginning of recitation; they cannot be placed in mailboxes or turned in late. Having said that, it is recognized that buses sometimes run late, you may be ill, etc., so you will receive credit for up to 3 unexcused late (turned in within 1 week of the due date) CPE. If your TA sees a pattern of lateness, you will not receive any credit for late CPE. If a situation arises in which you know you will not be able to turn in your CPE on time, send an email to your TA with a copy to Dr. Ackroff explaining the situation. If we believe you have a legitimate reason to turn in the CPE late, we will reply and grant you an extension to the next recitation. Print out the reply, and attach a copy of it to the CPE involved.

CPE **must** be turned in at the beginning of recitation, and you must turn them in at the recitation you are enrolled in. CPE turned in at the end of recitation will be counted as late; CPE turned in at another recitation will not be counted at all.

Each set of CPE is worth 8 points. The purpose of the CPE is to help you understand the material, so you receive the full 8 points for completing the CPE and turning it in (on time). Since the answers are in the book, it would not make sense to correct and grade them based on how well you did them. If you take the time to do them, and rework the ones you get wrong, it should be reflected in your exam scores.

The point of the CPE is to give you a chance to use what you should be learning to solve problems. The answers are in the book so you can tell whether or not you understand the concepts involved. However, we don't expect people to spend hours and hours on them. If you can't seem to figure out how to solve one of the problems, put down as much of the solution as you have, and then write a note that says "This is as far as I can get with this problem." If your TA feels you have made an honest effort at solving the problem, you will get credit for it.

Make sure you make a copy of your CPE before handing them in. These can be helpful to you as you review material and study for the exams. They will also be useful if your TA's records do not reflect

that you turned in a particular set. Since they are graded on an "all or none" basis, we do not keep CPE. Check the SAS Gradebook weekly to be sure you have received credit, and contact your TA promptly if there is a discrepancy. Don't wait until late November to tell us that you *really did* turn in the CPE that was due on September 29; we are unlikely to do anything about it at that point.

There are 14 sets of CPE, each worth 8 points, for a total of 112 points. (Chapter 11 has 2 sets; 11.3 - 11.5 and 11.6 - 11.7.) You will receive 18 bonus points for completing all 14 CPE, bringing the total CPE points for the course to 130. If you have more than 3 unexcused late CPE, you are not eligible for this bonus. Note that these bonus points are counted when we determine grade cutoff points (see below), they are not considered to be Extra Credit points.

- **Online Exams:** Online Exams are available in the "Tests & Quizzes" tab on sakai. The exams consist of conceptual and computational questions, like the class exams. They are different in that they are entirely multiple choice. You can get credit for guessing the right answer to a computational question; this will not work for the exams in class. However, you will be better off actually trying to solve the problems.

There are 12 online exams, each worth 20 points, for a total of 240 points. The schedule for the online exams appears below. Note that the availability dates are fixed; extensions cannot be granted for individual students. In the unlikely event that you are incapacitated for the entire time the exam is available, we will make alternate arrangements.

Taking the Online Exams: You are allowed 2 hours for each exam. Make sure you will have an uninterrupted 2 hours before you start the exam. You cannot "pause" the exam; once you start it, you have 2 hours. Also, be sure to save your answers after you answer each question. Click on "Submit for Grade" only when you are sure you are through with the exam. Once you submit your exam, you cannot work on it any more. You will be able to see your score, which questions you answered correctly, and the correct answers to each question after you submit your exam. If there is a problem while you are taking the exam (e.g., you lose your internet connection), email your TA and explain the situation. Your TA can reset the exam so that you can take it again. Your TA also has a life, so if you wait until 11:30 on the last night an exam is available and you run into a problem, you will probably be out of luck.

The exams are each available for a limited amount of time. You should take each exam shortly after the corresponding chapter is covered in lecture. Waiting until the end of the availability period is not a good idea, since the availability dates are fixed.

Correcting Online Exams: You may submit corrected copies of the first 10 online exams according to the schedule below. If you believe there is a discrepancy, please notify your TA immediately. As with CPE, if you wait until the end of the semester to try to correct records from early in the semester, you may not be successful.

If you scored 8 or more points, you can earn all 20 points; if you scored 4 - 7 points, you may raise your score to 10 points. **To receive the points, you must make a hard copy of the online exam, and attach your corrections.** For computational questions, re-work the problem to get the right answer. For conceptual questions, give a reference to the page number in the text that has the answer and copy the relevant part of the text. You must hand in your corrected exams in recitation or at the exam in class according to the schedule below. The exams for Chapters 13 and 14 cannot be corrected because there is not enough time at the end of the semester to grade them.

- **Final grades:** Grading in this course works differently from most other courses. Your grade will be determined by the total number of points achieved on exams, CPE, and Online Exams. However, do not think that achieving 90% of the total possible points guarantees you an A. In most courses, you are exposed to an overview of various aspects of a discipline; there is no way you can learn everything about the topic. In this course, we cover completely everything you are expected to know. The course is designed to present the material several times in different ways, so it is entirely possible for you to know everything we have presented.

As you can see, there are numerous opportunities to earn large numbers of points, and some of them are "gimmies" -- there is no good reason not to earn the maximum number of CPE and Online Exam points. So earning 90% does not necessarily represent the comprehension associated with an A grade.

At the end of the semester, points for all assignments are totaled for each student. An absolute frequency distribution (see Chapter 2 in your text) is made for each TA's students. (Since there is a certain amount of subjectivity in grading the essay and computational exam questions, we may use different cutoff points for each TA. The same cutoff points will be used for both sections for each TA.) Typically, scores cluster, and there are natural "cut points" in the distribution. The top 20% or so of each TA's students usually do *very* well on everything, and receive an A in the course. The next 25% or so do *pretty* well on everything (or very well on some things and not so well on others), and receive B or B+ for their grade. The next 40% or so do OK, and earn C or C+ grades. The bottom 10 or 15% receive D or F grades.

There are two factors that influence where we draw the cutoff points. As stated above, there are usually natural breaks in the distribution, and we use those as the initial cut points. The second factor is your TA's impression of how well you learned the material. Since your TA is looking at your CPE, reading your essay answers, and grading your computational exam questions, your TA may have a better understanding of how well you grasp the material than your numerical point total reflects. The reason for the "or so" in the description of the grade distribution is that if your TA thinks that more students than usual have a really good grasp of the material, there will be more A grades than usual; if your TA thinks that half the class "phoned in" their work, the distribution is not likely to be as generous.

Extra credit points (see below) are added to the total number of points you score after we determine the cutoffs.

Extra Credit:

There are three ways you can earn extra credit in this course.

- Your TA may give up to 30 extra credit points through pop quizzes. Since these are extra credit, they cannot be made up if you miss them. You must be in your assigned recitation section to earn these points.
- You may submit a paper providing feedback on the text and the course; both have been improved by such papers from previous classes. Feedback can be a list of misprints (other than those we already know about and have informed you of) to a chapter-by-chapter or lecture-by-lecture review of what was clear and what wasn't. Feedback on the recitation sections is also welcome. You can earn up to 20 extra credit points for this exercise.

- We have spent a fair amount of time "cleaning up" the Online Exams. There may, however, still be some errors lurking about. The first student to report a factual or computational error in an Online Exam to his or her TA will receive 5 extra credit points. "Errors" related to round-off will not qualify for this, as we do not consider them to be errors in the first place.

Remember, extra credit points are added to your score **after** we determine the cutoff points for each grade, so the points may result in your receiving a higher grade. Since grades are determined before we look at extra credit, not doing it cannot lower your grade in any way.

Attendance and Correspondence Policies:

- **Attendance:** You should attend all meetings of all of your classes. My lectures are based on the material in the assigned readings, but may also cover material not discussed in the readings. You are responsible for all of this material.

If you arrive late or must leave before class is over, please sit near a door and try to be as inconspicuous as possible. It is distracting to everyone to have people walking in and out of the classroom during class.

Classes are held according to the schedule below as long as the University is open. If the weather appears to be threatening, you can check the [Campus Operating Status](#) here.

If a class is cancelled, postponed, or moved on the day of class, there will be a member of the Psychology Department in the room at the scheduled time to make the announcement. Notices posted on doors or the blackboard are likely to be hoaxes.

- **Classroom Etiquette:** Please turn off all cell phones, etc., before class begins.

If you wish to use a laptop computer to take notes, that is fine. If you wish to use a laptop computer to surf the web, play games, IM your friends, etc., I would suggest you go to the nearest Student Center. This advice also applies to having side discussions with your classmates, reading newspapers, doing puzzles, etc.

- **Questions:** I encourage you to ask questions during class. If something is unclear, or if you have a question related to the material being discussed, please ask your question then. Chances are that some of your classmates would also like some additional discussion of the topic.

Because of schedule-related issues, I prefer not to answer questions before or after class.

- **Email:** I try to answer email promptly. Having said that,
 - Please use a Subject that gives me some idea what you are writing about. This is especially important if you send mail from an account other than eden. Mail from sexgoddess@aol.com with a subject of "hello" is likely to be considered spam and deleted unread.
 - If you ask me a question whose answer is on the course web page or Syllabus, my reply is likely to say that.
 - If you ask me a question about your standing in the course, please include your name and which

course and section you are enrolled in.

- Please re-read the section on "Questions" above. I realize that there are times when you are reviewing notes after class and/or before an exam when you will discover that you have a question. But it is in everyone's best interest for you to ask your questions in class, rather than after the fact, if you have a question while class is in session.
- As stated on the course web page, you are responsible for any announcements, etc., I send to the class via email. Emails are sent to the address that appears when your name is entered into "Search People" on the "Search Rutgers" page. There is a link on the course web page that allows you to update this address.

Lecture Schedule

Date	Lecture	Assignment for next class
Thursday, September 1	Class business; basic math test	Read the Syllabus and Chapter 1; register your clicker.
	Recitations do not meet this week.	
Tuesday, September 6	The basics: Mean, variance, & standard deviation	Read Chapter 2.
	Recitations do not meet this week.	
Thursday, September 8	(Monday Classes)	
Tuesday, September 13	Frequency Distributions: Actual and Theoretical	Read Chapter 3.
Thursday, September 15	The Normal Curve	Read Chapter 4.
Tuesday, September 20	Z scores are <u>THE</u> scores	Review Chapter 4.
	The standard error of the mean and	
Thursday, September 22	Confidence Intervals (Begin challenging material.)	Read Chapter 5.
Tuesday, September 27	Degrees of freedom and establishing population parameters	Read Chapter 6.
Thursday, September 29	(No Class)	
Tuesday, October 4	The t distribution, estimated CIs, and hypothesis testing	
Thursday, October 6	Review Chapters 1 - 6	Read Chapter 7
Tuesday, October 11	Correlation I	Read Chapter 8.
Thursday, October 13	Correlation II; Regression I	Review Chapter 8.
	Regression II and residual variance and the standard error of the estimate;	
Tuesday, October 18	Hypothesis testing: H_0 and H_1 , individual	Review for Midterm.

	differences, and the limits of inference in correlational research	
Thursday, October 20	Review for Midterm	Chapter 8 CPE.
Tuesday, October 25	MIDTERM CONCEPTUAL EXAM	
Thursday, October 27	MIDTERM COMPUTATIONAL EXAM	Read Chapter 9.
	Turn in CPE 8 and corrected OE 8 at the start of the exam.	
Tuesday, November 1	One-way independent groups ANOVA I	Review Chapter 9.
Thursday, November 3	One-way independent groups ANOVA II	Read Chapter 10.
Tuesday, November 8	Factorial ANOVA I	Review Chapter 10.
Thursday, November 10	Factorial ANOVA II	Review Chapters 9 and 10.
Tuesday, November 15	Review	Review ANOVA for exam.
Thursday, November 17	ANOVA CONCEPTUAL EXAM	
Tuesday, November 22	ANOVA COMPUTATIONAL EXAM	Read Chapter 11.1 - 11.3 and 11.6 through first 11.9
	Turn in CPE 10 and corrected OE 10 at the start of the exam.	
Thursday, November 24	(No Class – Thanksgiving)	Read Chapter 11.1 - 11.3 and 11.6 through first 11.9
Tuesday, November 29	Multiple comparison's and Dunnett's t	Read second 11.9 through the end of the chapter.
Thursday, December 1	Tukey's HSD	Read Chapter 13.
Tuesday, December 6	Statistical assumptions, ordinal data, nominal data, and F_{MAX}	Read Chapter 14.
	Extra Credit paper due at beginning of Lecture	
Thursday, December 8	Chi Square	Review for Final.
Tuesday, December 13	Review	
	Chapter 13 and 14 CPE due at beginning of Lecture.	
Monday, December 19	FINAL EXAM, Sections 03 - 06	12:00 - 3:00 PM, Beck AUD
Tuesday, December 20	FINAL EXAM, Sections 11 - 14	8:00 - 11:00 PM, LSH Aud

[Rules for Final Exam Conflicts](#)**Recitation Schedule****NOTE:** Recitation sections do not meet until the week of September 12.

Week of	Topic	Chapters	Due
September 12	Basics and frequency distributions	1 and 2	
September 19	The Normal Curve and <u>Z</u> scores	3 and 4	CPE 1, 2, and 3
September 26	standard errors and confidence intervals,	5	CPE 4
October 3	<u>t</u> scores, df, Hypothesis testing; Correlation	6 and 7	CPE 5
October 10	Correlation and regression; the null hypothesis	7 and 8	CPE 6
October 17	Regression; review for exam	8	CPE 7
October 24	No recitations this week.		
October 31	No recitations this week.		
November 7	Single factor designs: <u>F</u> tests and the <u>t</u> test	9	
November 14	Factorial ANOVA	10	CPE 9
November 21	No recitation sections this week.		
November 28	<u>t</u> -tests and multiple comparisons	11	
December 5	<u>t</u> -tests and multiple comparisons, cont'd	11	CPE 11.3 - 11.5; CPE 11.6 and 11.7
December 5	Assumptions underlying parametric tests; F_{MAX} ; ordinal data and Chi squared; review	13 and 14	

Online Exam Schedule

The Exams are available from 12:05 AM on first day of availability through 11:55 PM on the last day.

Chapter	Available Online	Corrections Due
1	September 5 - September 19	Recitation 2, week of September 19
2	September 12 - September 19	Recitation 2, week of September 19
3	September 12 - September 26	Recitation 3, week of September 26
4	September 19 - October 3	Recitation 4, week of October 3
5	September 26 - October 3	Recitation 5, week of October 10
6	October 3 - October 10	Recitation 5, week of October 10
7	October 10 - October 17	Recitation 6, week of October 17
8	October 10 - October 24	Exam, October 27th
9	November 7 - November 14	Recitation 8, week of November 14
10	November 14 - November 21	Exam, November 22
11	No online exam	

12	No online exam	
13	December 5 - December 12	No corrections allowed
14	December 12 - December 19	No corrections allowed