

**Hybrid Quantitative Methods in Psychology Course Syllabus**  
**830:200, Section 21**  
**Spring 2020**  
**Rutgers University**

**In-class session location:** Chemistry Building, room 1203

**In-class session time:** Tuesdays, 10:20 AM-1:20 PM

**Instructor:** Dr. Rachel Rubinstein

**Instructor's Office Location:** Tillett Hall 303

**Instructor's Office Hours:** Thursdays 12-2PM or by appointment

**Instructor's Email:** rachrubi@psych.rutgers.edu

**Textbook:** Basic Statistical Analysis (9<sup>th</sup> Edition). Sprinthall, R. C. (2012).  
Needham Hts., MA: Allyn & Bacon.

**Goals:**

1. Describe the conceptual logic behind hypothesis testing and various inferential statistics, and identify the appropriate statistical test for various research designs
2. Execute null hypothesis tests and describe results in writing
3. Read, understand, and evaluate statistical results used in publish research and orally communicate about these findings
4. Think critically about media reported statistics and be able to identify potentially misleading reports

In addition, 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 (QR)

## **General information**

### **General Principle**

Please, please, PLEASE ask questions!! Please!! It's the only reliable way I have of knowing whether you understand the course material. 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 struggling. Please help everyone out by asking!

### **Course format**

Each week starting with the second week of classes, you will be responsible for watching lecture videos online BEFORE we meet that week. You can expect the total duration of the

week's videos (there will usually be more than one) to either be equal to a standard class period (80 minutes) or shorter than a standard class period. Within some videos, there will be quizzes that you will need to take before that week's class period, and these will count toward your final grade. In class each week, I will give a review lecture, but I will not be able to cover everything that is in the videos, so it is very important that you watch the videos before class and come to class prepared with any questions that cropped up while watching the videos. After the review lecture, I will walk everyone through a sample problem and then you will break into groups and complete practice problems.

## Requirements

**Materials.** You will need to bring a calculator to each class session. Graphing calculators and other calculators that store equations are not permitted. **Bring your book and calculator to EVERY CLASS, as I will often be referring to specific tables or examples in the text.**

### Baseline technical skills necessary for online courses

- Basic computer and web-browsing skills
- Navigating Canvas Technology

### Skills necessary for this specific course

- Collaborating on VoiceThread
- Recording a slide presentation with audio narration using VoiceThread

## Assessment

Exam 1	15%
Exam 2	15%
Exam 3	15%
Comprehensive final exam	20%
Classwork	10%
Homework	10%
VoiceThread presentation	10%
Video quizzes	5%
<b>Total</b>	<b>100%</b>

**Grading:** Final grades will be assigned according to 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%

***THIS GRADING RUBRIC APPLIES TO ALL STUDENTS IN THIS CLASS. NO EXCEPTIONS WILL BE MADE FOR ANY REASON.***

**Three unit exams.** 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.

**Comprehensive final exam.** This will be similar in structure to the unit exams (so, part will be conceptual multiple choice and part will be computational), but will cover material from the whole course.

**Classwork assignments.** You will be doing computational assignments in each class. You will turn them in for credit. Obviously, if you're not there, you can't get the credit for in-class assignments. You can miss one class with no penalty, but you will subsequently lose points for missing classwork. If you come to every class session, you will receive 1% of extra credit added to your final course average.

Class attendance is not mandatory; however, since the in-class assignments constitute a substantial portion of your grade, and you cannot make them up if you miss them without documentation, you need to attend consistently. In addition, you should not skip class because missing lecture will put your conceptual understanding and procedural knowledge in jeopardy.

**Homework assignments.** There will be a few homework assignments throughout the course of the class that will be due shortly before each of the hourly exams. These homework assignments are meant as a low-stakes way to practice for the exam. You will upload pictures of your homework onto Canvas BEFORE the deadline, and then turn in the paper copies to me in class before the exam so I can grade them. I will post the answer keys after the deadline so you can study from your mistakes. For these assignments, for each problem, you will receive no credit if you leave it blank, half credit if you make an honest effort, and full credit if you get the answer correct. **NOTE: You will NOT be allowed to turn the homework in late since the answer keys will be posted. If you do not submit the pictures of the homework before the deadline on Canvas, you will not receive credit for the homework.**

**VoiceThread Presentation.** You will be responsible for a group presentation of a journal article that outlines its purpose, hypotheses, statistical tests, and conclusions that you will present using VoiceThread on Canvas. You will be graded both by me and by your classmates on this presentation, and will be responsible for rating others' presentations as well. In order to record your presentation, you will need access to a computer with a microphone. If you would prefer to complete an alternate written assignment, please let me know.

**Video quizzes.** Within many of the videos, there will be quiz questions for you to take throughout the video. These quizzes allow me to see how well you understand the material. You get half credit for any answer and full credit for the correct answer. The video quizzes are due before the start of class each week.

***Make-up exams and classwork:*** In order to qualify for a make-up for exams **OR** for make-up classwork, you must notify me ***in advance*** by email ***and*** provide documentation (i.e., a doctor's note, police report, etc.). If you don't meet **all** of these criteria, you will not be permitted to take a make-up. **Remember, there are no makeups for the homeworks.**

***Academic Integrity:*** Getting any form of assistance from other students or other outside sources on exams 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)

## Class Calendar

(Subject to change if necessary)

<u>Date</u>	<u>Text readings</u> (Read AFTER you've watched the videos and class has met)	<u>Topics and events</u>	<u>Videos and video quizzes due*</u> *Note: if video is labeled "quiz" you will find it in the Assignments tab on Canvas. If it is labeled "no quiz" you will find it in the Media Gallery, where you can search by title.
Tues 1/21	None	Orientation and review of syllabus and resources available	None
Tues 1/28	Chapter 1 Ch 9 (pp. 198-208)  Chapter 2 (pp. 32-47)  Chapter 3 (pp. 54-59; 61-66)	Types of measurement – nominal, ordinal, interval, ratio. Independent vs. dependent variables.  Measures of central tendency – mean, median, mode. Graphing frequency distributions  Measure of variability – range, variance, and standard deviation. Kurtosis and skew.	<ul style="list-style-type: none"> <li>• Fundamental Principles and Terminology (quiz)</li> <li>• Central Tendency and Variability (quiz)</li> <li>• Shapes of Distributions (quiz)</li> </ul>
Tues 2/4	Chapter 4	Characteristics of the normal distribution, Z-scores and their use.	<ul style="list-style-type: none"> <li>• Z scores (quiz)</li> <li>• Z scores and the normal distribution (quiz)</li> </ul>
Tues 2/11	Chapter 7 (pp. 144-151; 156-167)	Null hypothesis testing and the z-test	<ul style="list-style-type: none"> <li>• Sampling distribution of the mean (quiz)</li> <li>• Null hypothesis testing and the z-test (quiz)</li> <li>• Z-test problem walkthrough (no quiz)</li> </ul>
Sunday 2/16 11:59 PM		<b>Pictures of Homework 1 due on Canvas 11:59</b>	

		PM (No class)	
Tues 2/18		EXAM 1	
Tues 2/25	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.	<ul style="list-style-type: none"> <li>• Single-sample t-test (quiz)</li> <li>• Using and performing the single-sample t-test (no quiz)</li> </ul>
Tues 3/3	Chapter 10 (ignore p. 253)	The Sampling Distribution of the Difference and the independent samples t-test. Confidence intervals for mean differences	<ul style="list-style-type: none"> <li>• Independent samples t-test (quiz)</li> <li>• Independent samples t-test problem walk-through (no quiz)</li> <li>• Confidence intervals (quiz)</li> </ul>
Tues 3/10	Chapter 11 (pp. 287-296; 300-308; 310-311)  Chapter 15 (pp.447-453)	The Correlation Coefficient: Pearson's r  Repeated-measures (within-subjects) t-tests.	<ul style="list-style-type: none"> <li>• Correlations: Pearson's r (quiz)</li> <li>• Pearson's r problem walk-through (no quiz)</li> <li>• Paired samples t-test (quiz)</li> <li>• Paired samples t-test problem walk-through (no quiz)</li> </ul>
Tues 3/17		SPRING BREAK	
Sunday 3/22 11:59 PM		Pictures of homework 2 due on Canvas (No class)	
Tues 3/24		EXAM 2	
Tues 3/31	Chapter 12 (pp. 330-350) (ignore Steps 1-4 on p. 342 for calculation of 1-Way F)	The 1-way Analysis of Variance – Testing for mean differences among more than 2 groups. Post-hoc testing (Tukey test).	<ul style="list-style-type: none"> <li>• One-way ANOVA conceptual video (quiz)</li> <li>• One-way ANOVA problem walk-through (no quiz)</li> </ul>
Tues 4/7	Chapter 12 pp. 350-360 (ignore steps 1-7 on pp. 353-354); 363-365	Factorial ANOVA – Testing for the effects of more than 1 independent variable on a dependent variable. Main effects and interactions.	<ul style="list-style-type: none"> <li>• Factorial ANOVA conceptual video (quiz)</li> <li>• Interpreting factorial ANOVA results (quiz)</li> <li>• Factorial ANOVA problem walkthrough (no quiz)</li> </ul>
Sunday 4/12 11:59 PM		Pictures of homework 3 due on Canvas (No class)	
Tues 4/14		EXAM 3	

Tues 4/21	Ch 14 pp.404-417	Linear Regression Analysis: Predicting values on a criterion using a predictor and the regression equation.	<ul style="list-style-type: none"> <li>• Regression conceptual (quiz)</li> <li>• Regression problem walkthrough (no quiz)</li> </ul>
Tues 4/28		Review for Final Exam	
DATE TBA		VoiceThread presentations due (No class)	
DATE TBA		Evaluations of classmates' VoiceThreads due	
Wednesday May 13, 8-11 AM		COMPREHENSIVE FINAL EXAM	