



## Statistics for HRM I: SPRING, 2020

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Statistics for HRM I 37:533:440:01	JLB 103	Weds. 10:20-1:20 PM	<a href="https://PollEv.com/ralpharodriguez/register?groupkey=W0zsZlzfFMX3bXP2gJbIdNq3">https://PollEv.com/ralpharodriguez/register?groupkey=W0zsZlzfFMX3bXP2gJbIdNq3</a>
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### Teaching Aide:

**Zixin “Ayla” Wang**

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Office Hours: TBA

### TEXTS:

- **Required Text:** Privitera, Gregory J. (2019). *Essential statistics for the behavioral science (2<sup>nd</sup> Edition)s*. Thousand Oaks, CA: SAGE Publications. ISBN-13: 978-1506386300 (Paperback). **MAKE SURE YOU GET THIS EDITION.**
- **Required Website:** As you prepare for class, you are **EXPECTED** to **THOROUGHLY** study the **FREE** online materials at <https://edge.sagepub.com/priviteraess>. For every assigned chapter, you are expected to complete (read, review, or do) the Action Plan, Learning Objectives, Quiz, eFlashcards, Video and Multimedia, Web Resources (this section is recommended but optional), and any SPSS in Focus Screenshots that apply to the chapter.
- **STRONGLY Recommended Text:** Using IBM SPSS Statistics (2<sup>nd</sup> Edition), James O. Aldrich and James B. Cunningham. Sage, 2016. ISBN: 978-1-4833-8357-6. You might want to read this in parallel with the Privitera text. It is a “light read” but is VERY helpful with SPSS. NOTE: You will also find abundant resources on Youtube for specific SPSS functions. These are, of course, free... but of uneven quality (although most are really pretty good).
- **YOU and the Readings:** Assigned readings from the text AND OTHER SOURCES are noted in the syllabus. You are expected to have completed the readings **BEFORE** they are presented/discussed in class.
- **SOFTWARE:** This course makes use of SPSS for calculations. SPSS is installed on the computers that will be available during office hours and used by students during classes and exams. SPSS is also available on computers in all RU computer labs. I highly recommend that students purchase SPSS licenses for their own computers. If you choose to, you may purchase a student license for SPSS which is good for a limited

period of time for a reasonable fee. NOTE: Facility with SPSS is frequently a big advantage in a job search. The price for a 6-month student license of the “Grad Pack Standard” is available at <https://studentdiscounts.com/gradpackcomparison.aspx> for approximately \$50 with an immediate download. (Verified on January 14, 2020.)

**Course Description:** This course is an applied course, designed to provide students an introduction to statistical techniques used to make HRM and other data-based decisions. The context is human resource management, but the applications are also relevant to other business and management decisions. An emphasis is on fostering (a) a conceptual understanding of different statistical techniques so the student will know which statistical analysis is appropriate for answering a particular applied question (e.g., which training program led to higher productivity?) and (b) a practical set of skills so the student can carry out the analysis and make the correct decision.

The emphasis in this course is on developing a basic understanding of statistics commonly used in human resource management, knowing how to calculate various statistics (whether by calculator or using SPSS), and most importantly, how to interpret results.

**SMLR Learning Goals:** Statistics for HR is designed to meet sections of two SMLR Learning Goals:

**II) Quantitative Skills – Apply appropriate quantitative and qualitative methods for research on workplace issues.**

- Formulate, evaluate, and communicate conclusions and inferences from quantitative information
- Apply quantitative methods to analyze data for HR decision making including cost-benefit analyses, ROI, etc. (HRM)

**VI) Application – Demonstrate an understanding of how to apply knowledge necessary for effective work performance**

- Apply concepts and substantive institutional knowledge, to understanding contemporary developments related to work
- Understand the internal and external alignment and measurement of human resource practices (HRM)

**Course-Specific Learning Goals:** Upon completion of this course students should understand:

- The fundamentals of sampling and probability and the role they play in inferential statistics
- The use and calculation of descriptive statistics
- The use and calculation of statistics testing significant differences
- The statistics of relationships and causality
- The interpretation of statistics commonly used by human resource professionals
- Making better human resource decisions with statistics
- Explaining analysis outputs both orally and in writing

In addition, the student should be familiar with SPSS:

- Creating a dataset
- Defining variables
- Transforming variables and creating new variables
- Performing all statistical analyses covered in the course using SPSS
- Interpreting SPSS output

**Attendance:** Attendance at every class is **required**. Absences for illness, religious holidays work-related, and other events recognized by Rutgers University will be excused **WITH PROPER DOCUMENTATION**. Even excused absences are not valid reasons for work not to be submitted in time. If you are absent, it is YOUR responsibility to secure notes from a classmate or “catch up” during office hours.

**NOTE:** You do NOT earn points for mere attendance, activity, and/or good behavior in this course. HOWEVER, failure to meet expectations in these three areas will be penalized. This is because, while participation requires your presence, mere presence is not necessarily accompanied by worthwhile participation. **You are**

**permitted 3 absences before a ONE-LETTER GRADE PER ABSENCE WILL BE IMPOSED.** Any unexcused lateness of more than 15 minutes will count as ½ absence.

**Class Contribution (the top 10% of students will earn up to 3 additional points applied to your course average!):** This is a course citizenship grade and will reward you for preparing for, participating in, and enriching the learning experience. It will be based on both frequency and quality of class participation, with quality weighted more heavily than frequency. Valued behaviors include: initiating discussions, voicing original ideas, challenging others, defending your own views, raising important and relevant points, attempting to answer unpopular questions, and generally demonstrating a command of assigned reading materials. Behaviors to avoid include: reiterating obvious points, making irrelevant remarks, distracting the class, and failing to participate when asked. NOTE: for students who find it more difficult to participate in class, I will begin several Discussion Boards to provide you that opportunity digitally.

**Examinations:** There will be three examinations as noted on the course schedule. In total, Exams are 60% of the course grade, with earlier exams more heavily weighted to encourage you to get a good start. Each examination will have two parts. Part 1 will consist of a set of questions covering the concepts covered in the section of the course being tested. They may include multiple choice questions, short-answer questions, and problems. Part 2 of the test will be handed out at the conclusion of Part 1 and will consist of a number of problems which you will solve using the SPSS routines assigned for “Homework” and/or covered in class.

**Make-up policy:** An examination grade of “0” will be assigned to any student who is absent without a legitimate **DOCUMENTED** excuse on the date of a regularly scheduled test. Legitimate excuses include illness (verified by a note from a doctor), inclement weather (only when the Rutgers Information Service (848-932-INFO) indicates that Rutgers is closed), scheduled religious holidays, business trips or events where attendance is required by an employer, when the instructor emails the class announcing class is suspended, or other dire circumstances such as a death in the family.

**Students with learning disabilities or other reasons for taking the examination outside the regular examination time should present a statement to that effect with appropriate documentation as early in the semester as possible, but certainly prior to the first midterm examination.**

A makeup exam will be held at a time convenient to the instructor which can reasonably be attended by the affected students. Any examination cancelled by the instructor will be held at the next regularly scheduled class period.

**Homework/SPSS:** This area of student assessment offers significant opportunity for EXTRA CREDIT in the course. There are four subsections:

- Problems from the text (noted in attached schedule) are to be done out of class and are due on the indicated dates. Problems from the text are to be submitted IN CLASS BEFORE class begins (placed on the desk in the front of the room). ONLY THE HARD COPY SUBMITTED IN CLASS WILL BE GRADED. There are 57 Privitera textbook questions assigned. **Each question is worth 2 points.**
- SPSS exercises (noted under the Sakai “Assignments” tab) are to be done out of class and are due on the indicated dates. SPSS Exercises must be submitted ONLY digitally through the appropriate “Assignment” box in Sakai. **There are 8 SPSS assignments, with each one valued at 10 points.**
- A “Survey Design” exercise is assigned that is **valued at 10 points.**
- Nine different readings are included under the Sakai “Resources” tab. This assignment calls for preparing a two-page (double-spaced) review of the research design and statistical analysis of **one** of these readings (YOUR choice. Note that they are ordered in the same sequence of how these topics are presented in the course.) You may submit this assignment ANY time prior to or on April 20<sup>th</sup>. In your report, be sure to comment specifically on the outline, and logic of the presentation.

You are also expected to address the appropriateness of the research methodology, hypothesis testing, and statistical test(s). This assignment is **valued at 20 points**.

**Therefore, the total possible “Homework/SPSS” points are:**

**124 (Problems+ Survey Design Assignment)**

**80 (SPSS)**

**20 (Exec. Summary on Research Paper)**

**224 TOTAL POINTS (24 TOTAL EXTRA CREDIT POINTS POSSIBLE!!!)**

**Exercises & Quizzes (18%):** POP QUIZZES WILL BE USED TO MONITOR YOUR PREPARATION (readings, assignments, etc.). Almost EVERY class will include a graded quiz or exercise. When they are quizzes, they will be short (10-minute), objective quizzes, based on that day’s reading(s). Any in-class exercises will also be based on the day’s readings. All of these Quizzes and Exercises are equally weighted and the total average will make up 20% of your overall course grade. **No make-ups for either Quizzes or Exercises will be permitted** but the TWO lowest (or MISSING) grades will be dropped.

**Grading:** Grades will consist of the following components:

	<b>POINTS</b>		<b>Course Grade</b>	<b>Total Pts.</b>
<b>Midterm 1</b>	<b>230</b>		<b>A</b>	<b>900+</b>
<b>Midterm 2</b>	<b>200</b>		<b>B+</b>	<b>850-899</b>
<b>Midterm 3 (Final)</b>	<b>170</b>		<b>B</b>	<b>800-849</b>
<b>Homework/SPSS</b>	<b>200</b>		<b>C+</b>	<b>750-799</b>
<b>Quizzes</b>	<b>200</b>		<b>C</b>	<b>700-749</b>
<b>TOTAL POINTS</b>	<b>1000</b>			

## Frequently Asked Questions:

1. What's the policy on Academic Integrity and Plagiarism?

**Academic Integrity:** The rights of students will be protected to ensure that test scores are related to competence in the subject matter. Therefore, all examinations will be carefully proctored. If cheating is detected, it will be prosecuted to the limit allowed by University policies. An academic integrity contract will be distributed in class. Students must submit a signed copy of the contract before the second class they attend.

**YOU ARE RESPONSIBLE FOR KNOWING THE BOUNDARIES OF "PLAGIARISM."** Generally, it includes submitting any work which does not originate from your own effort, without attributing proper credit.

2. Will slides be available to provide a guide to class lectures? Can I expect them to be an adequate substitute for class discussions? Will they make a good comprehensive study guide?

The PowerPoint slides for the lectures will be posted on the course's Sakai website but **DO NOT** expect class to merely repeat the text, section-by-section! You can't "get" this material unless you actually **DO IT**. You should expect class to be a **WORKSHOP**, where the most important parts of the textbook material are highlighted and elaborated within the general context of the text, current practice, and the kind of skill development that will enhance your career development. **You are expected to arrive to class, having already read and worked through the text and SAGE PUBLISHING'S Student Support Site. If you are vague on any area of the assigned readings, you are expected to have your questions reasonably formulated for classroom discussion.**

In current teaching/training parlance, this is a "flipped" course where you are expected to do the preparation that you can best do independently outside-of-class in order that class time can be used more efficiently to work on problems with the assistance of the professor and TA. Most classes will **BEGIN** with a Quiz to incentivize and reward your preparation (homework, readings, assignments, etc.).

3. What is the course attendance policy?

**Classroom attendance is essential and mandatory and exercises not turned in on the due date and without a valid excuse will receive no points.** Attendance and preparation are the keys to the type of Socratic approach that will be used in this course. Many of the in-class exercises will be completed in teams with your class colleagues, so your attendance is also critical to the entire class. Therefore, attendance at every class is required. Absences for illness (verified by a note from a doctor), religious holidays and other events recognized by Rutgers University will be excused. If you know you are going to miss a class because of a religious holiday, I would appreciate an email prior to the holiday. I know that employer demands sometimes require even the most conscientious student to miss a class. However, business trips and office functions are **NOT** valid reasons for not turning exercises in on time. Even "excused" absences are not valid reasons for work not to be completed and submitted as scheduled. Note that, in any case, only absences supported by **VALID AND DOCUMENTED** conclusive evidence will be excused.

4. Can I work with another classmate to complete homework and assignments?

Yes, **HOWEVER... YOUR** work must be independently completed and submitted. That is, you may collaborate with each other but your final product must be completely independent of what your "partner" submits. Any duplicative SPSS files will result in "0" grades for both parties.

5. Do you have any final advice on how to do well in this course?

Sure! From my perspective, it is really simple. Attend class. Read in advance, even if you can't make total sense of the material. Do the homework, as assigned. Get help during office hours. The TA and I are happy to give you all the help you can stand! **AND FINALLY...** persevere! Don't give up!

**I believe that "Statistics for HRM" is THE course that will make the difference between you either being a DECISION-MAKER or directions-follower in your career. While it will surely require significant work for most students, it also has the highest personal ROI for you. In T&D language, mastering the content in this course will significantly raise your HR-career upside.**

**Good luck in the course. I am committed to helping you establish a logical foundation that will equip you to solve sticky HR-related organizational problems using reliable and valid data.**

## **Privitera Problems ++**

(Hard copies due at beginning of assigned class)

### **Assignment #1 Due: Jan. 29**

**26 Points**

IMPORTANT NOTE: This is the first Homework assignment. It includes two parts. One part consists of questions that you will find in the back of Chapters 1 and 2. THIS WILL BE DUE (HARD COPIES) IN CLASS ON MONDAY, Feb. 3<sup>rd</sup>.

The 2nd part will be found under the Sakai "Assignments" tab and will be performed on SPSS and, like ALL SPSS assignments, should be submitted through the related Sakai "Assignments" tab. Upload all files you produce in the assignments and enter all comments in the Assignment text box. In preparation, we will be introducing you to the program IN CLASS. See other notes regarding focused tutorials earlier in the syllabus. NOTE: An "SPSS General Instructions Guide" is also available in the Privitera text (pages 513-524).

Text Questions (see Sakai "Assignments" for SPSS questions):

1. Chapter 1: 5, 7, 13, 17, 21, 25, 27, and 31.
2. Chapter 2: 13, 17, 23, 29, and 31.

### **Assignment #2 Due: Feb. 5**

**16 Points**

1. Chapter 3: 11, 15, 23, and 25.
2. Chapter 4: 7, 9, 21, and 29

### **SPSS Privitera Due: Feb. 12**

**(Submit through Sakai**

1. Chapter 5: SPSS
  - a. Work through 5.10 SPSS in Focus – pp. 155-157. In YOUR OWN data entry, change the values of at least 4 of the 16 values.
  - b. Submit your data file and output file in the "Assignment #3" assignment bin.

### **Assignment #3 Due: Feb. 19**

**14 Points**

1. Chapter 5: 1, 5, 13, 17, and 19.
2. Chapter 6: 5 and 21.

### **Assignment #4 Due: Mar. 4**

**10 Points**

1. Chapter 7: 1, 3, 5, 15, and 17.

**Assignment #5 Due: Mar. 4****6 + 10 Points**

1. Chapter 8: 3, 11, and 31.
2. Your organization wants to begin measuring "Employee Engagement" and asks you to come up with a valid and reliable ORIGINAL instrument. Create an Employee Engagement Survey that you would distribute to an employee base. This should be no more than 2 pages long. Please add/create the questions you think are relevant to measure employee engagement. If you think any demographic question should be part of this survey, please add those as well. (BUT ONLY INCLUDE RELEVANT QUESTIONS!).

**For reference purposes, please look up Gallup 12 survey questions** Ex: (<https://www.shrm.org/hr-today/news/hr-magazine/pages/0510fox3.aspx>). Your survey should also be consistent with the survey design material presented in class. **SUBMIT YOUR CREATED SURVEY AS A HARD COPY IN CLASS.** (Create and format it as a complete project.

**Assignment #6 Due: Mar. 11****8 Points**

1. Chapter 9: 5, 9, 11, and 21a.

**Assignment #7 Due: Mar. 25****16 Points**

1. Chapter 10: 7, 13, 17, and 25.
2. Chapter 11: 3, 5, 19, and 31.

**Assignment #8 Due: Apr. 1****6 Points**

1. Chapter 12: 5, 15, and 25.

**Assignment #9 Due: Apr. 15****12 Points**

1. Chapter 13: 3, 9, 13, 15, and 21

2. **Additional Question**

This is the ANOVA Table for a multiple linear regression. Complete the table:

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	207503.831	8			
Residual			4129.833		
Total	653525.841	116			

## **SPSS Exercises**

These exercises are duplicated in the class Sakai site, under the “Assignments” tab. All of your resulting files that you produce from these instructions are to be uploaded on the relevant “SPSS Exercise #X” folder. Your responses to any questions regarding your conclusions, etc. should be written in the related exercise’s comment box.

### **SPSS Exercise #1** **Due: Jan. 29**

Go to Sakai - Resources and open Data Sets. Find the Excel file Sales Training Comparison.xlsx. Open SPSS and convert the Excel file to an SPSS file. Enter value labels, note the variable type, and specify any missing values.

Open the data set Employee.data.sav (see "Resources"). Do frequency distributions for categorical variables.

Are there outliers in “salary”? If so, what would you recommend doing about them?

Create categories for “salary” and “salbegin” and create new variables using those categories. Do frequency distributions for both sets of variables. Discuss the differences.

For “salary” and “salbegin” calculate 10th, 25th, 50th, 75th and 90th percentiles. Calculate means and standard deviations for these variables.

### **SPSS Exercise #2** **Due: Feb. 5**

Open Employee data.sav.

Select females, calculate typical education level, salary, prevexp, and minority designation using the appropriate measure of central tendency.

Select males and calculate the same measures.

Using all data, calculate standard deviation and variance of salbegin.

### **SPSS Exercise #3** **Due: Feb. 12**

Use the dataset “insurance\_claims.sav” to answer the following questions:

Calculate descriptive statistics and frequencies for “claim\_amount,” “coverage,” and “income”. Describe each distribution using your calculations. If you do not use a statistic in describing the variable, do not report it.

Convert data for these three variables to z scores.

Report the standard error of the mean for the three variables. For “income”, explain what the SEM means, why it is useful in understanding the distribution, and why the notion of SEM signals the importance of sample size.



**SPSS Exercise #4****Due: Feb. 19**

Open "2012 CPS final.sav."

I maintain that mean salary (WSAL\_VAL) is \$59,500. Note the null and alternate hypotheses.

What is the probability of the null hypothesis being correct?

I maintain that men and women earn (on average) the same amount. What is the null hypothesis? The alternate hypothesis?

What is the probability of the null hypothesis being correct? Should we assume equal variances? What is the general rule that guides assumption of equal variances?

**SPSS Exercise #5****Due: Mar. 25**

Open "2012 CPS final.sav."

I maintain that people who are married –civilian spouse present (A-MARITL) earn (WSAL\_VAL) the same as people who are divorced. What is the null hypothesis? The alternative hypothesis. Should we assume equal variances? Explain why.

Do you reject the null or fail to reject the null? Explain from the 95% confidence interval how it supports your decision to reject the null or fail to reject the null. (HINT: Look at A\_MARITL in variable view for values.)

Open job satisfaction.sav. I want to compare pre- and post-training job satisfaction. What is the appropriate test? Why?

What are (a) the null and (b) the alternate hypotheses? What are your conclusions? Explain from the 95% confidence interval how it supports your decision.

**SPSS Exercise #6****Due: Apr. 1**

Open "patient\_los.sav"

Consider which of the variables are relevant to "Treatment cost" (cost).

Note these and explain why they might be relevant.

Note which (if any) interaction terms might be important.

State the null and alternative hypotheses.

Perform an ANOVA to test your hypotheses.

State your findings and explain them.

Open "worldsales.sav."

Analyze the impact of product and continent on revenue using ANOVA

State your findings and explain them.

**SPSS Exercise #7****Due: Apr. 22**

Open "2012 CPS data – exer.sav"

Consider which of the variables are relevant to "Total wage and salary amount - Person" (WSAL\_VAL).

Note these and explain why they might be relevant.

Perform a correlation analysis to test for relationships

State the null and alternative hypotheses for significance for any two correlations.

State your findings and explain them.

Open "hourlywagedata.sav"

Regress "hourly salary" on "years experience" and "age range."

Interpret your results and state in APA style.

State the null and alternative hypotheses for significance of the model.

Describe how we interpret the standard error of the estimate.

Open "car\_sales.sav."

Regress price on engine\_s, horsepower, wheelbase, width, length, curb\_wgt, fuel\_cap, and mpg.

State your findings and explain them.

Which predictor is most important? How do you know?

## Spring 2020 Class Schedule (Statistics for HRM: Wednesday morning)

Date	Topic	Reading Assignment	"Homework"
Workshop #1 Jan. 22	Introduction to Statistics <b>Statistics as a decision-making tool</b>	Appendix A (pages 493-512); Pages xxxv-xli; <b>Chapter 1*</b>	
Workshop #2 Jan. 29	Summarizing Data: Frequency; Distributions...; <b>Summarizing Data: Central Tendency</b>	Chapter 2; <b>Chapter 3*</b>	<b>Assignment #1; SPSS Exercise #1</b>
Workshop #3 Feb. 5	<b>Summarizing Data: Variability</b>	<b>Chapter 4*</b>	<b>Assignment #2; SPSS Exercise #2</b>
Workshop #4 Feb. 12	<b>Probability, Normal Distributions, and z Scores</b>	<b>Chapter 5*</b>	<b>SPSS Privitera; SPSS Exercise #3</b>
Workshop #5 Feb. 19	Exam Review (Privitera Chaps. 1-5) SPSS Review		<b>Assignment #3; SPSS Exercise #4</b>
Workshop #6 Feb. 26	<b>10:20-12:00 MIDTERM EXAM 1 (Chaps. 1-5)</b> <b>12:00-1:20 Survey Design From</b> <b>Conceptualization to Data Input</b>	View "Survey Design" Video	
Workshop #7 Mar. 4	Characteristics of the Sample Mean <b>Hypothesis testing – significance, effect size and power</b>	Chapter 6 <b>Chapter 7*</b>	<b>Assignment #4; Assignment #5</b>
Workshop #8 Mar. 11	Testing Means: One-Sample t Test With Confidence Intervals <b>Testing Means: Two-Independent Sample t Test With</b> <b>Confidence Intervals</b>	Chapters 8 <b>Chapter 9*</b>	<b>Assignment #6</b>
Workshop #9 Mar. 25	Testing Means: Related Samples t Test <b>One-Way ANOVA Between-Subjects and Within-Subjects</b> <b>(Repeated Measures) Designs</b>	Chapter 10 <b>Chapter 11*</b>	<b>Assignment #7; SPSS Exercise #5</b>
Workshop #10 Apr. 1	Two-Way ANOVA Between-Subjects Factorial Design	Chapter 12	<b>Assignment #8; SPSS Exercise #6</b>
Workshop #11 Apr. 8	<b>10:20-12:00 MIDTERM EXAM 2 (Chaps. 6-10)</b> <b>12:00-1:20 The Structure of Research; In-class exercise</b>		
Workshop #12 Apr. 15	<u>Correlation</u> and Linear Regression	<b>Chapter 13*</b>	<b>Assignment #9; Final due date for Exec. Summary on Research Paper</b>
Workshop #13 Apr. 22	Correlation and <u>Linear Regression</u>	<b>Chapter 13*</b>	<b>SPSS Exercise #7</b>
Workshop #14 Apr. 29	<u>Correlation and Linear Regression</u> SPSS Review of ALL tests reviewed during the semester		

**FINAL Exam: Tuesday, May 12, 2020, 4:00-7:00 PM**

**Legend: Bold\* = Critical Content**