RUTGERS
School of Management and Labor Relations

HR Decision-Making: Data-Based Decisions (Spring 2020)
38:533:542:03

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Data-Based Decisions 38:533:542:03	JLB 103	Monday	7:20-10:00 PM

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COURSE OVERVIEW:

Course Description: This course is an applied course, designed to provide students an introduction to statistical techniques used to make 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: Data-Based Decisions is designed to meet sections of two SMLR Learning Goals:
II) Quantitative Skills – Apply appropriate quantitative and qualitative methods for research on workplace issues.
     o Formulate, evaluate, and communicate conclusions and inferences from quantitative information
     o 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
     o Apply concepts and substantive institutional knowledge, to understanding contemporary developments   related to work
     o Understand the internal and external alignment and measurement of human resource practices (HRM)

COURSE OBJECTIVES:
My Goals in Teaching This Course:
1. To develop in YOU the ability of students to reason analytically and critically.
2. To provide YOU an understanding of basic business research methods and develop the ability of students to be conversant regarding business research decisions.
3. To provide YOU with the necessary tools for evaluating and understanding business research.
4. To provide YOU with the necessary tools for planning and designing business research.
5. To develop in YOU the ability to communicate original research and critique existing research clearly and incisively through oral

presentation and writing.

6. To increase YOUR comfort and facility with statistical methods and the use of technology as a research and communication tool.

My ADDITIONAL Goals for YOU: Upon completion of this course, YOU will understand:
1. The fundamentals of sampling and probability and the role they play in inferential statistics.
2. The use and calculation of descriptive statistics.
3. The use and calculation of statistics testing significant differences.
4. The statistics of relationships and causality.
5. The interpretation of statistics commonly used by human resource professionals.
6. Making better human resource decisions with statistics.
7. Explaining analysis outputs both orally and in writing.

In addition, YOU will develop a facility with SPSS in:
1. Creating a dataset.
2. Defining variables
3. Transforming variables and creating new variables.
4. Performing all statistical analyses covered in the course using SPSS.
5. Interpreting SPSS output.

TEXTS:

- **Required Text:** Privitera, Gregory J. (2019). *Essential statistics for the behavioral science (2nd 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 Screencasts that apply to the chapter.

- **STRONGLY Recommended Text:** Using IBM SPSS Statistics (2nd 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).

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.)

ASSIGNMENT EXPECTATIONS

The format of this course will be lecture and discussion, with a prominent "workshop" element. It will be highly interactive. This means that your assigned reading MUST be done BEFORE class. Much of the communication will take place electronically on the course Sakai site. You are expected to have completed your reading assignments **prior** to class and should come prepared to discuss the material. Students will be responsible for all the assigned material. YOU are responsible for securing all notes from missed classes. University, College and Departmental policies will be observed in this course.

Assignments are due as indicated. I will try to adhere to the enclosed timeline. You must type all written work (ONLY MS Word, please!). Check for grammar & spelling errors. Errors will be penalized. Always keep a backup copy. **No INDIVIDUAL extra credit assignments will be given.**

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 (36%): There will be two examinations as noted on the course schedule. They will include material from the text, classroom discussions, the readings, and any Sakai Discussion Board threads. Each examination will be worth 18% of the course grade. They will be split 50-50 between fact-based "objective" questions and application-based short answer and essay questions.

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 when all students needing to take the makeup can reasonably be expected to be present. Any examination cancelled by the instructor will be held at the next regularly scheduled class period.

Homework/SPSS (26%): This area of student assessment offers significant opportunity for EXTRA CREDIT in the course. There are four subsections:
- o Problems from the text (noted in attached schedule) are to be done out of class and are due on the indicated dates 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 1 point.**

- o 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 6 points.**

- o A "Survey Design" exercise is assigned that is **valued at 6 points.**

- o 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 20th. 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 6 points.**

  Therefore, the total possible "Homework/SPSS" points are:
   63 (Problems+ Survey Design Assignment)
   48 (SPSS)
   <u>**06**</u> **(Exec. Summary on Research Paper)**
   117 TOTAL POINTS (17 TOTAL EXTRA CREDIT POINTS POSSIBLE!!!)

Exercises & Quizzes (18%): 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.

GROUP PROJECT (20%): Students will be assigned to project teams. These teams will exist for the entire semester and will have two primary responsibilities, a presentation and supporting a research paper.
RESEARCH PAPER AND PRESENTATION: Each team choose a specific focus to be decided and submitted for approval by the beginning of class on February 10th. You are to propose and conduct original research on some aspect of student satisfaction, sentiment, and/or reaction to some aspect of their experience at R.U.. This will require that you strictly define your variables, conduct a literature review on related current research, propose at least two separate hypotheses, create a reliable/valid survey, gather evidence, perform relevant statistical tests, and arrive at appropriate conclusions. Your final report must include references to at least 10 sources from peer-reviewed journals published within the past 10 years (additional older sources may also be included). Your report must also include descriptive statistics on your sample, a graphic model, a correlation table including relevant conclusions, and a regression table with its own relevant conclusions. Finally, you are required to share your findings with the class, giving a 20-30 minute presentation on the date

of our scheduled FINAL EXAM (May 11th). Groups are free to determine the most effective format for their presentations, remembering that it is difficult to communicate research findings and statistics without graphical representations (e.g., "slides" or handouts).

Your supporting report will be an Executive Summary of your process and findings. In terms of paper length, please consider that Executives have very little time for meaningless adjectives and adverbs. Write enough to communicate the important details and support them with relevant appendices. No more. It is reasonable to suppose that the total report will be between 8-20 pages. This paper submission is due IN-CLASS (hard copy) on April 27th. NO LATE PAPERS WILL BE ACCEPTED.

NOTE ON YOUR TOPIC: In lieu of the above assignment, groups that perform REAL research <u>for REAL organizations</u> will be eligible for extra credit, based on the quality of the research and recommendations. Ideally, you can use this opportunity to network your way into a profit-making or non-profit organization by providing research assistance that helps them solve a REAL current business problem. These may include issues of employee satisfaction, engagement, department or organizational effectiveness, etc. Remember that your project requires your conclusions to be based upon a survey instrument that YOU have created. You will have to volunteer your services to organizations to determine how to meet your joint interests. **NOTE:** For organizations, think broadly. They may be schools, religious organizations, campus organizations, small or large businesses, support (landscaping, maintenance, etc.) or educational (Management, Economics, etc.) departments within Rutgers University, etc. Most of these organizations will want to be assured that your project is being done under the supervision of a faculty member. You may give them my name and contact information. You might be able to get some other research ideas by consulting with the friendly people at "Community Service at Rutgers" (from their website: "Community Service at Rutgers is part of the Office of Student Involvement & Community Service within the department of Student Life. In our office, you will find advisors dedicated to community service programs, the Student Volunteer Council headquarters, and many resources for your volunteer needs."). They are the university's link to community (mostly non-profit) opportunities.

Course Grading: Grades will consist of the following components and weighted as indicated:

Exam 1 (Midterm)	18%	Exercises & Quizzes	18%
Exam 2 (Final)	18%	Group Project	20%
Homework (Problems & SPSS)	26%		

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 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?
   <u>**Classroom attendance is essential and mandatory and exercises not turned in on the due date and without a valid excuse will receive no points.**</u> 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 with your semester-long Project Team, so your attendance is also critical to your team's performance. 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, 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 "Data-Based Decisions" 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: Feb. 3**	**13 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. 3rd.

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. 10**	**8 Points**

1. **Chapter 3: 11, 15, 23, and 25.**

2. **Chapter 4: 7, 9, 21, and 29**

SPSS Privitera	**Due: Feb. 17**	**(Submit through Sakai "Assignments")**

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. 24**	**7 Points**

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

Assignment #4	**Due: Mar. 2**	**5 Points**

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

Assignment #5   Due: Mar. 23   9 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. 30   4 Points

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

Assignment #7   Due: Apr. 6   8 Points

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

Assignment #8   Due: Apr. 13   3 Points

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

Assignment #9   Due: Apr. 20   6 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: Feb. 3

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. 10

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. 17

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. 24

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: Apr. 6

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. 13

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. 27

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, horsepow, 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 (Monday)

Date	Topic	Reading Assignment	Homework (to be submitted in class)
Workshop #1 **Jan 27**	Introduction to Statistics Statistics as a decision-making tool	Appendix A (pages 493-512); Pages xxxv-xli; **Chapter 1***	
Workshop #2 **Feb. 3**	Summarizing Data: Frequency; Distributions…; Summarizing Data: Central Tendency	Chapter 2; **Chapter 3***	**Assignment #1** **SPSS Exercise #1**
Workshop #3 **Feb. 10**	Summarizing Data: Variability	**Chapter 4***	**Assignment #2** **SPSS Exercise #2**
Workshop #4 **Feb. 17**	Probability, Normal Distributions, and z Scores **Project Team assignment and organization.**	**Chapter 5***	**SPSS Privitera** **SPSS Exercise #3**
Workshop #5 **Feb. 24**	Characteristics of the Sample Mean	Chapter 6	**Assignment #3** **SPSS Exercise #4**
Workshop #6 **Mar. 2**	Hypothesis testing – significance, effect size and power	**Chapter 7***	**Assignment #4**

Workshop #7
Mar. 9
	MIDTERM 1 (Chapters 1-7):
	    7:20-9:00 PM: Part #1; Part #2 (SPSS Problems)
	    9:00-10:00 PM: Presentation on Survey Design		

Workshop #8 **Mar. 23**	Testing Means: One-Sample t Test With Confidence Intervals	Chapter 8	**Assignment #5**
Workshop #9 **Mar. 30**	**Testing Means: Two-Independent Sample t Test With Confidence Intervals**	**Chapter 9***	**Assignment #6**
Workshop #10 **Apr. 6**	**Testing Means: Related Samples t Test** **One-Way ANOVA Between-Subjects and Within-Subjects (Repeated Measures) Designs**	Chapter 10; **Chapter 11***	**Assignment #7** **SPSS Exercise #5**
Workshop #11 **Apr. 13**	Two-Way ANOVA Between-Subjects Factorial Design	Chapter 12	**Assignment #8** **SPSS Exercise #6**
Workshop #12 **Apr. 20**	**Correlation** and Linear Regression	**Chapter 13***	**Assignment #9** **Final due date for Exec. Summary on Research Paper** **TEAM PROJECT Papers Due**
Workshop #13 **Apr. 27**	Correlation and **Linear Regression**	**Chapter 13***	**SPSS Exercise #7**

Workshop #14
May 4
	MIDTERM 2 (Chapters 8-13):
	    7:20-9:00 PM Exam Part #1
	    9:00-10:00 PM Exam Part #2		

FINAL Exam: TEAM PROJECT PRESENTATIONS (Monday, May 11, 2020 from 7:00-10:00 PM)   Legend: **Bold*** = Critical Content