



## DSIM 201 – BUSINESS STATISTICS

**Mon/Wed, Jan 8 – Apr 22, 2024**

**12:30 – 1:45 PM / 2:00 – 3:15 PM, DCOB #216**

**Jacksonville University – Spring 2024**

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**Instructor:** **Dr. Jim Mirabella**, *Professor of Decision Sciences*    **Office Hours:** By appt only  
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### **COURSE DESCRIPTION:**

This is an introductory course in statistics and its applications to business. Topics include: descriptive statistics, basic probability concepts, estimation, hypothesis testing, ANOVA and regression. Microsoft Excel will be used as a tool throughout the course.

### **REQUIRED TEXTS & OTHER MATERIALS:**

Lind, Marchal & Wathen. Basic Statistics for Business & Economics, 5<sup>th</sup> edition, 2006.

(NOTE: **free** ebook is on Blackboard)

MS Excel will be utilized throughout the course for all applications.

### **FORMAT / TEACHING STRATEGIES:**

The course will mainly be taught as a facilitated lecture. As this course is quantitative and qualitative in nature, a portion of the course will utilize the computer, while the major portion will involve class discussion and experiential learning. Class participation and completion of practice assignments are vital to learning. The class will NOT be live streamed. Blackboard contains video lectures for the entire course, so students that miss class or wish to work ahead or repeat a lesson may view these on their own.

## EVALUATION METHODS:

- **Attendance:** While attendance is not checked regularly, excessive absences will likely impact one's grade since some of the material on the exams come from class lectures (some of which is not in the text).
- **Practice Problems from Textbook** will only be covered upon student request. Students are encouraged to practice as much as possible, as it is the best preparation for success. The key to understanding statistical concepts that are tested is to be comfortable with the problem-solving techniques first.
- **Quizzes:** There will be several quizzes in the course, almost weekly, with some being problem-based and some being conceptual. The use of the textbook and all notes are permitted on all quizzes. Excel will be used as instructed in class. Failure to complete the quizzes by the due date will result in a grade of zero. Collaboration is permitted on the quizzes.
- **Exams:** There will be three (3) exams in the course. Each exam will consist of statistical problems and conceptual questions. The use of the textbook and all notes are permitted on all exams. Excel will be used as instructed in class. The final exam is not comprehensive. Exams will be conducted online during the scheduled class period; failure to complete the exam during the class period without acceptable documentation will result in a grade penalty of up to 100%, at the instructor's discretion. Collaboration is NOT permitted on the exams.

## COURSE GRADING

- **Online Quizzes (problems)** --> 27% of course grade
- **Online Quizzes (concepts)** --> 18% of course grade
- **Exam 1** --> 15% of course grade
- **Exam 2** --> 20% of course grade
- **Final Exam** --> 20% of course grade

## COURSE GRADING SCALE

- **90 ~ 100** --> A- to A
- **80 ~ 89** --> B- to B+
- **70 ~ 79** --> C- to C+
- **60 ~ 69** --> D- to D+
- **0 ~ 59** --> F

## POLICIES:

- **Attendance** is not counted toward a student's grade but is highly encouraged to maximize learning the material for the exams and assignments.
- **Homework** is designed for practice in preparation for the exams.
- **Late quizzes & exams** will not be accepted without documented extenuating circumstances. If a student is aware of a future absence, prior arrangements must be made to reschedule the exam.
- **Academic Honesty:** Any act of academic misconduct in this course will result in an F for the assignment involved. To see examples of what counts as academic misconduct, as well as the university-level consequences for academic misconduct, look to JU's policy at [www.ju.edu/academicintegrity](http://www.ju.edu/academicintegrity).
- **Fundamental to Jacksonville University's mission is support for an environment where divergent ideas, theories, and philosophies can be openly exchanged and critically evaluated. Consistent with these principles and the concept of Academic Freedom, this course may involve the discussion of ideas that you find uncomfortable, disagreeable, or even offensive. These ideas are intended to be presented in an objective manner, they are not intended to persuade, and are not an endorsement of what you should personally believe.**

## Tentative Dates & Unit Topics

NOTE: There will be no class meetings on

- JAN 15 (M) due to MLK Day
- MAR 11 (M) & MAR 13 (W) due to Spring Break

**ASSIGNMENT GUIDELINES/SCHEDULE (may be changed as circumstances warrant):**

<u>Week # / Dates</u>		<u>Topics &amp; Activities</u>
Week 1: Jan 8, 10	<b>Topics:</b>  <b>GRADED ITEMS:</b>	Introduction, Statistical Thinking, Basic Terminology, Types of Variables, Levels of Data, Misuses of Statistics, Freq. Dist, Graphs, Central Tendency, Dispersion Online concepts quiz 1 from Chapters 1, 2, 3, 4, 9 by January 28 (4% of grade). Online problems quiz 1 from Chapters 1, 2, 3, 4, 9 by January 28 (4% of grade).
Week 2: Jan 17		No class on Monday “ ”
Week 3: Jan 22, 24		“ ”
Week 4: Jan 29, 31	<b>GRADED ITEMS:</b>	Exam 1 on Wednesday, January 31 (15% of grade)
Week 5: Feb 5, 7	<b>Topics:</b> <b>GRADED ITEMS:</b>	Counting Techniques, Probability, Discrete Probability Online problems quiz 2 from Chapters 5 & 6 by February 11 (3% of grade).
Week 6: Feb 12, 14	<b>Topics:</b> <b>GRADED ITEMS:</b>	Normal Probability Online concepts quiz 3 from Chapters 5, 6, 7, 8 by February 18 (4% of grade). Online problems quiz 3 from Chapters 7 & 8 by February 18 (3% of grade).
Week 7: Feb 19, 21	<b>Topics:</b>	Sampling, Confidence Intervals, Sample Sizes
Week 8: Feb 26, 28	<b>GRADED ITEMS:</b>	Online concepts quiz 4 from Chapter 9 by March 3 (3% of grade). Online problems quiz 4 from Chapter 9 by March 3 (4% of grade).
Week 9: Mar 4, 6	<b>GRADED ITEMS:</b>	Exam 2 on Wednesday, March 6 (20% of grade)
Week 10: Mar 11, 13		SPRING BREAK – NO CLASSES
Week 11: Mar 18, 20	<b>Topics:</b> <b>GRADED ITEMS:</b>	Hypothesis Testing, p-values, One Sample Hyp Tests Online concepts quiz 5 from Chapter 10 by March 31 (4% of grade). Online problems quiz 5 from Chapter 10 by March 31 (4% of grade).
Week 11: Mar 25, 27	<b>Topics:</b> <b>GRADED ITEMS:</b>	Two Sample Hypothesis Tests, Analysis of Variance Online problems quiz 6 from Chapters 11 & 12 by April 7 (5% of grade).
Week 12: Apr 1, 3	<b>Topics:</b>	“ ”
Week 13: Apr 8, 10	<b>Topics:</b> <b>GRADED ITEMS:</b>	Correlation & Regression Online concepts quiz 7 from Chapter 11, 12 & 13 by April 16 (3% of grade). Online problems quiz 7 from Chapter 13 by April 16 (4% of grade).
Week 12: Apr 15, 17	<b>Topics:</b>	“ ”
FINALS: Apr 22	<b>GRADED ITEMS:</b>	Exam 3 on Monday, April 22, 3:00 pm (20% of grade)

## RECOMMENDED PROBLEMS:

### Chapter 1: Problems 1.1, 1.2

Supplementary Problem 1: Identify the following as either Nominal, Ordinal, Interval or Ratio.

- S1a) the gender of students
- S1b) the weights of students in pounds
- S1c) the students' Math SAT scores
- S1d) the students' ranking of their professor on a 5-point scale for excellence
- S1e) the amount of Red Bull drunk by students in fluid ounces
- S1f) the time in minutes students spend texting while listening to Stats lectures
- S1g) the room temperature of the Stats class in degrees Fahrenheit
- S1h) the zip codes of each student's current residence
- S1i) the letter grades earned by students in Statistics

Supplementary Problem 2: At your place of employment, 100 employees are randomly selected and asked the distance of their commute to work. From this group a mean of 15.2 miles is computed. Identify the following as either (A) Observation, (B) Parameter, (C) Population, (D) Sample, or (E) Statistic.

- S2a) all employees at that place of employment
- S2b) the computed 15.2 miles
- S2c) the 100 students selected
- S2d) 6 miles distance traveled by one employee
- S2e) the mean commute distance for all employees at that place of employment

Supplementary Problem 3: Conduct a Categorical Data Analysis on the CAR data - **cylinders**.

Supplementary Problem 4: Conduct a Categorical Data Analysis on the CAR data – **types**.

Supplementary Problem 5: Frequency Distribution Analysis on the CAR data – **city mpg**.

Supplementary Problem 6: Frequency Distribution Analysis on the CAR data – **hwy mpg**.

Supplementary Problem 7: Stem-and-leaf plot on the TIPS data – **tip rate rounded**

Supplementary Problem 8: Descriptive Statistics Analysis on the CAR data – **sugg. retail price..**

Supplementary Problem 9: Descriptive Statistics Analysis on the CAR data – **hwy mpg**.

Supplementary Problem 10: Suppose you applied to be a waiter or waitress at a local restaurant and asked the manager what a typical dinner shift was like. How might the manager describe the typical size of a party at a table? The mode would be useful, since there are a few repeated values. You might have an occasional table for 20, but, for the most part, parties consist of one to five people. What if you asked for the typical size of a check, so you could estimate your tips? The mode makes no sense, since you would not likely have many repeats, and the mean is easily distorted by that table for 20, but the median tells you that half the time you can expect to earn a certain amount of money in tips. Now suppose you were a real estate agent and you were asked by a client about the "typical" home in a subdivision. Being the astute agent you are, you have gathered the following information on each house in the subdivision: Price, square footage, numbers of bedrooms, number of bathrooms, and age. What statistic (mean, median, or mode) would you use to describe each aspect of the typical home and why? Try to imagine the type of answers you would be giving your client based on your selections for a subdivision that has 100 homes with a wide variety of sizes and prices.

Supplementary Problem 11: Given a sample of 50 IQ scores ranging from 80 to 145, if the 145 were accidentally typed in error as a 415, what would be the impact on the following statistics (Mean, Median, Standard Deviation, Range)? (answer with INCREASE, DECREASE or REMAINS THE SAME). .

**Chapter 5:** Problems 5.13, 5.14, 5.20, 5.25, 5.29b, 5.35, 5.36, 5.37, 5.39, 5.40, 5.60, 5.61

Supplementary Problem 12: Counting Techniques

1. A restaurant offers 3 choices of meat, 2 choices of potatoes, 4 choices of vegetables, and 5 choices of dessert. How many different possible meals can be made if a customer must select one item from each category?
2. If a student can select 1 of 3 language courses, 1 of 5 math courses, and 1 of 4 history courses, how many different schedules can be made?
3. How many different 5-digit ZIP codes are possible if digits can be repeated?
4. If a student can select 5 novels from a reading list of 20 for a course in literature, how many different possible ways can this selection be done?
5. A quiz consists of six multiple choice questions. Each question has three possible answer choices. How many different possible answer keys can be made?
6. At the Baskin Robbins, how many different two-scoop cones can you order if there are 31 flavors of ice cream and 3 types of cones?
7. An identification tag consists of two letters followed by three numbers.
  - a. How many different tags can be made if repetitions are allowed?
  - b. If repetitions are not allowed?

**Chapter 6:** Problems 6.21, 6.22, 6.24

**Chapter 7:** Problems 7.19, 7.21, 7.25, 7.28, 7.34, 7.35, 7.42, 7.50

**Chapter 9:** Problems 9.05b, 9.07b, 9.08, 9.15c, 9.16c, 9.17c, 9.18b, 9.19, 9.21, 9.22, 9.27, 9.28, 9.29, 9.30, 9.31, 9.32b, 9.33, 9.34, 9.43, 9.45, 9.47, 9.48, 9.50, 9.51, 9.52, 9.54

**Chapter 10:** Problems 10.5, 10.6, 10.7, 10.8, 10.11, 10.12, 10.13, 10.14, 10.27, 10.28, 10.31

**Chapter 11:** Problems 11.3, 11.4, 11.5, 11.6, 11.9, 11.10, 11.11, 11.12, 11.15, 11.17, 11.20, 11.21, 11.22

**Chapter 12:** Problems 12.9a, 12.9b, 12.10a, 12.10b

**Chapter 13:** Problems 13.5a, 13.5b, 13.15a, 13.15b

## **ACADEMIC HONESTY:**

“Members of the Jacksonville University community are expected to foster and uphold the highest standards of honesty and integrity, which are foundations for the intellectual endeavors we engage in.

To underscore the importance of truth, honesty, and accountability, students and instructors should adhere to the following standard:

***I do not lie, cheat, or steal, nor do I condone the actions of those who do***

Academic misconduct occurs when a student engages in an action that is deceitful, fraudulent, or dishonest regarding any type of academic assignment that is intended to or results in an unfair academic advantage. In this context, the term “assignment” refers to any type of graded or ungraded work that is submitted for evaluation for any course. Academic misconduct includes but is not limited to cheating, collusion, falsification, misrepresentation, unauthorized collaboration on assignments, copying another student’s work, using or providing unauthorized notes or materials, turning in work not produced by the individual, and plagiarism.

Furthermore, providing deceitful, fraudulent, or dishonest information during discussions of an academic manner with faculty are also examples of academic misconduct.” (Jacksonville University Academic Catalog)

## **DISABILITY-RELATED INFORMATION:**

Students with a documented disability requesting classroom accommodations or modifications, either permanent or temporary, resulting from the disability are encouraged to register with the Disability Support Services (DSS) office. This office will assist in recommending accommodations that eliminate barriers in academic coursework and/or guide you through the different supportive mechanisms that we have to offer. This office is located on the third floor of the Davis Student Commons, room 336. The office can also be contacted through their website (<https://www.ju.edu/disabilityservices/index.php>).

Note: Students are encouraged to register with the DSS office at the beginning of the term and/or prior (if/when possible), as accommodations are not provided retroactively.