Statistics in Business
Course Syllabus

Information

Course
Statistics in Business
- When: 10:30 to 11:50 AM, Monday – Thursday.
- Where: 134 Mendoza College of Business.
- Why: Required course for the *Master of Science in Business* degree.

Professor
Ken Kelley, Ph.D.
- Email Address: `KKelley@ND.Edu`
- Office Hours: Monday 8:00–10:00, by appointment, or anytime my door is open.
- Office Location: 363B Mendoza College of Business.
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Teaching Assistant
Kinsey Hoffman
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Description

Statistics is the science that deals with the (a) collection, (b) description, (c) analysis, (d) interpretation, and (e) presentation of data. Statistics can be used to describe a particular data set (termed descriptive statistics) as well as to draw conclusions about the population from a particular data set (termed inferential statistics). *Statistics in Business* applies statistical methods in business contexts in order to address business related questions and help make evidence based decisions. In *Statistics in Business* you will learn to apply commonly used statistical methods in business contexts and how to interpret analyses performed by others.

Objectives

The overarching objective of *Statistics in Business* is for students to describe data and make evidence based decisions using inferential statistics that are based on well-reasoned statistical arguments. The specific course objectives are to:

- describe data with descriptive statistics;

- perform statistical analyses;

- interpret the results of statistical analyses;

- make inferences about the population from sample data.

Required Textbook & Software

Textbook

Anderson, D. R., Sweeney, D. J., & Williams, T. A. (2012). *Essentials of Modern Business Statistics With Microsoft Excel* (5th Edition). South-Western: Mason, OH.

This textbook presents the numerous processes involved in making evidence based, real-world business decisions. The book is written from a conceptual point of view and focuses on the meaning of the numbers, not derivations or mathematical proofs. This approach to statistical education is endorsed by the American Statistical Association and their Guidelines for Assessment and Instruction in Statistics Education (i.e., the GAISE Report: `http://www.amstat.org/education/gaise/GaiseCollege_Full.pdf`). This Anderson, Sweeney, and Williams book is part of the most widely used business statistics series and is highly regarded in the field.

Software

We will use Microsoft Excel to implement many of the statistical methods and Microsoft Word is used for many of the homework assignments. Correspondingly, access to Excel and Word is required.

Electronic Devices

Laptop computers are not generally permitted. On designated days, Excel, but not other applications, may be used on student laptops. However, the use of mobile phones, MP3 players, and other electronic devices is not allowed.

Course Notes

I will provide a note packet for each of the topics. However, the course is much more than simply a set of note packets. Correspondingly, they should *not* be regarded as all that is necessary to understand the course material and implement the methods.

Attendance

Attendance is required.

Participation

Students are required to work on in-class assignments and actively participate during class, which necessarily requires student attendance. Your time in class will be more enjoyable and productive if you participate fully in activities, discussions, and ask as well as answer questions.

Assignments

There will be an assignment for most topics, the assignments are due electronically via email to the teaching assistant on the designated due date using Word, with any Excel output copied and then pasted into Word. Late assignments will receive a 10% penalty for every 24 hour period in which they are late, starting immediately after assignments are due. The assignment component will count 30% toward the course grade.

Quizzes

Students are required to take a quiz on most Thursdays or other announced day. The quiz component of the course grade will be weighted according to the number of possible quiz points. The quiz that most negatively impacts the course grade the most will be dropped. The quiz component will count 20% toward the course grade.

Special Needs

Please let me know if you have any special needs that should be addressed at the beginning of the semester. We can work together so that any special needs you have are met.

Examinations

There are two examinations. Examinations are based on the readings noted below on the schedule, assignments, in-class worksheets, quizzes, and class discussions. The format of the examinations is varied with multiple choice, fill-in, short answer, and calculation based questions. Students are allowed to use a help sheet that is one standard $(8\frac{1}{2} \times 11)$ piece of paper with handwritten notes on each side for each of the two examinations. The help sheet for a specific exam may contain handwritten notes, equations, definitional terms, worked examples, et cetera, but no material may be printed or attached to the help sheet, which will be turned in with the exam. Standard calculators are required. Exam 2 (i.e., the Final Exam) is semi-cumulative, in the sense that the material continues to build on itself and will apply differently in new situations. Please take special notice of the examination dates given in the schedule below, as they are fixed and not negotiable. Exam 1 and Exam 2 account for 25% and 35% of the final grade, respectively.

Getting Help

Help is regularly available. The teaching assistant and I will do whatever we can to help you you master the material. Statistics more than many other subjects is incremental, where material continues to build on other material. The last topic, for example, combines various aspects of almost everything else discussed in the course. That being said, if you are not sure that you understand the material completely, please seek help early and often. We will meet with you whenever possible.

Collaboration

Students are encouraged to discuss classroom topics, course notes, handouts, readings, previous quizzes, and assignments, especially in the assigned groups. Discussing course materials generally leads to better success for all who take part in the discussion, provided that all parties are actively engaged in the conversation. If students work collaboratively on all parts of the assignment, one assignment may be turned in for all students in the MSB assigned groups. Quizzes and exams must be done individually.

Grading

Grading for *Statistics in Business* will be based on quizzes (10%), assignments (30%), and examinations (60% total). The equation that governs the numeric course grade is

$$Grade = .10 Quizes + .30 Assignments + .25 Exam_1 + .35 Exam_2.$$

As all Notre Dame Graduate Business classes, the target class GPA is between 3.3 and 3.6.

Course Schedule

Date	Topic(s)	Topical Reading(s)
•6/17	•Introduction to Course •Course Expectations	
•6/18	•Data & Statistics: An Overview	•Sections 1.1–1.5 •Sections 2.1, 2.2, & 2.4
•6/19	•Probability	•Sections 4.1–4.4
•6/20	•Probability, Continued	•Sections 4.1–4.4
•6/24	•Describing Distributions with Numbers	•Sections 3.1–3.4, & 3.6
•6/25	•Describing Distributions with Numbers, Continued	•Sections 3.1–3.4, & 3.6
•6/26	•Uniform Distributions •Normal Distributions	•Sections 6.1–6.2
•6/27	•Uniform Distributions •Normal Distributions, Continued	•Sections 6.1–6.2
•7/1	•Association Between Two Variables	•Section 3.5
•7/2	•Wrap-up Part 1 Topics •Review for Exam 1 •Homework Q & A	•Prepare Review Questions
•7/3	•Exam 1 (Exam will be during class.)	•Bring Calculator •Bring Help Sheet
•7/4	•No Class – Happy Independence Day!	
•7/8	•Review of Exam 1 •Sampling Distributions •The Sampling Distribution of the Sample Mean	•Sections 7.1–7.5

•7/9	•Interval Estimation for a Population Mean (σ unknown) •Interval Estimation for a Population Mean (σ known)	•Sections 8.1–8.2
•7/10	•Rationale of Hypothesis Testing •Hypothesis Testing for a Population Mean (σ known)	•Sections 9.1–9.3
•7/11	•Rationale of Hypothesis Testing •Hypothesis Testing for a Population Mean (σ known)	•Sections 9.1–9.3
•7/15	•Hypothesis Testing for a Population Mean (σ unknown)	•Section 9.4
•7/16	•Inference for Paired Means	•Section 10.3
•7/17	•Inference for Independent Means	•Sections 10.1–10.2
•7/18	•Inference for Independent Means, Continued	•Sections 10.1–10.2
•7/22	•Inference for Proportions •Inference for Two Proportions	•Sections 8.4 & 9.5 •Sections 11.1 & 11.3
•7/23	•Inference for Two Proportions, Continued	•Sections 11.1 & 11.3
•7/24	•Multiple Regression	•Sections 13.1–13.7
•7/25	•Multiple Regression, Continued	•Sections 13.1–13.7
•7/29	•Multiple Regression, Continued	•Sections 13.1–13.7
•7/30	•Wrap-up Part 3 Topics •Review for Exam 3 •Homework Q & A	•Prepare Review Questions
•7/31	•No class! •Reading Day/Study Day	
•8/1	•Exam 2	•Bring Calculator •Bring Help Sheet

Academic Honesty

Students in *Statistics in Business* are expected to abide by the University of Notre Dame Honor Code for all matters relating to the course. Recall that the University's Honor Code states "as a member of the Notre Dame community, I will not participate in or tolerate academic dishonesty."

Syllabus Disclaimer

The information provided on this syllabus is tentative and may be modified. Modifications to the syllabus will be announced during class.