QMB-6305-901
Managerial Decision Analysis
Spring 2023

USF Muma College of Business
Department of Information Systems Decision Sciences
UNIVERSITY of SOUTH FLORIDA

Instructor: Dr. Ronald K. Satterfield
Office: CIS 2054
Office Hours: Announced on Canvas.
E-mail: rsatterf@usf.edu (The Canvas email function is a bit cumbersome. Please email me directly at this address rather than going through Canvas.)

TEXTBOOK: Berenson, Mark, David Levine, Kathryn Szabat, and David Stephan, Basic Business Statistics: Concepts and Applications, 14th Ed., Prentice-Hall, Inc.

Optional Alternative: Berenson, Mark, David Levine, and Kathryn Szabat, Basic Business Statistics: Concepts and Applications, 13th Ed., Prentice-Hall, Inc.

The current edition is the 14th. Bear in mind that should you choose to use an older edition of the text problem numbers, chapter organization, and problem data may have changed.

SOFTWARE: Microsoft Excel, Minitab, and R with R Studio. Excel and Minitab are available to USF students free of charge via apps.usf.edu. For any technical assistance you need in gaining access call USF Tech Support at 974-1222. Minitab also offers 30-day free trials of its software via direct download and academic licenses for students at nominal cost. R and R Studio are both open source and available online as free downloads. Install R first from www.r-project.org, then install R Studio from www.rstudio.com. The free version of R Studio Desktop is recommended. There are numerous online sites that can give you assistance if needed with these tasks. We will begin the course using these packages, so it is strongly recommended you have them installed and available for use on your machine.

Additionally, we will be using several common add-in packages with R. They can be installed all at once or individually. To install these packages all at once copy and paste the following command into R/R Studio.

```
install.packages(c("rmarkdown", "car", "Hmisc", "rio",
"moments", "corrplot", "MASS"),dep=TRUE)
```

To install them individually an example line of code would be:

```
install.packages("rio")
```

As R and R Studio are open source and extremely popular in the business analytics community, you will find numerous sources online to help you use them. You're encouraged to use those sources as needed.

COURSE DESCRIPTION

Modern business statistics encompasses the collection, analysis, presentation, and use of data to assist in the decision-making process. Statistics can be thought of as the science and art of making sense of numerical data. Computer hardware and software, especially via R and R Studio, has given the ability to analyze immense amounts of data. Thus statistics has emerged as one of the essential keys to good management and critical today to the important field of business analytics. Virtually every manager at least occasionally needs to deal with data whether in maintaining or improving regular day-to-day operations or finding new opportunities. Also, managers need to be able to communicate with analytical professionals to express needs and understand the results of analytics projects.

This course introduces you to the essentials of statistics and statistical programming. The ideas in the course are organized around several main topics: How to gather data, how to summarize raw data into information, how to use limited information to make predictions and inferences about problems of interest, and how to build models to aid decision making. Statistical software will be used heavily in this course as analysis today is nearly always done with these tools.

This course teaches the basic statistical tools used in quantitative analysis in business. After a brief review of basic concepts, measures of central tendency and dispersion, and probability distributions, the course will concentrate on confidence intervals, hypothesis tests, regression, and correlation. The emphasis will be on applications, concepts and interpretation of results, rather than derivations and calculations.

The problems listed on the syllabus are found in Berenson/Levine/Krehbiel/Stephan, our main text. It is recommended that you work as many problems as you need to gain competence with the material after listening to the lectures. Some of the problems should be worked by hand, others with software.

LEARNING OBJECTIVES

At the conclusion of this course the successful student will:

1. Know the basics of the Central Limit Theorem and Sampling Distributions.
2. Understand the fundaments of various common probability distributions.
3. Be able to use and interpret confidence intervals and hypothesis tests.
4. Be able to build and interpret simple statistical models with regression.
5. Know how to evaluate the quality of fit of a simple statistical model.
6. Understand how to apply and interpret basic analysis of variance methods.

COURSE ASSIGNMENTS AND GRADE DETERMINATION

Mid-Term Examination	200 points	(Due February 19, 2023)
Regression Analysis Project	100 points	(Due March 5, 2023)
ANOVA Project	50 points	(Due March 5, 2023)
Total	**350 points**	

This is a 350-point course. Letter grades will be awarded according to the scale below.

Letter Grade	Percent Score
A	93% - 100%
A-	90% - 93%
B+	87% - 90%
B	83% - 87%
B-	80% - 83%
C+	77% - 80%
C	73% - 77%
C-	70% - 73%
D+	67% - 70%
D	63% - 67%
D-	60% - 63%
F	Below 60%

MATERIAL COVERAGE

Session	Supporting Video	Supporting Text Material
1/10/23	Module 1	Introduction & Basic Terminology, Chapters 1, 2, and 3 (Chapter 3 sections 1, 2, 3 and 4 only) Data Collection, Tables and Charts, Basic Descriptive Measures
1/17/23	Module 2*	Chapters 6 and 7 Normal and Other Probability Distributions Sampling Distributions
1/24/23	Module 3*	Chapter 8 Confidence Intervals
1/31/23	Module 4*	Chapters 9 Hypothesis Testing
2/7/23	Module 5*	Chapter 10, Sections 1, 2, 3, and 4 Comparing Two Populations
2/14/23	Module 6*	Chapter 13 Simple Regression
2/21/23	Module 7*	Chapter 14 Multiple Regression
2/28/23	Module 8*	Chapter 11 Analysis of Variance (ANOVA)

***Denotes an online video and associated materials to be reviewed prior to this session.**

The Midterm Exam is due via electronic submission via Canvas February 19, 2023, covering Modules 1 through 5. Regression and ANOVA Projects are due via electronic submission via Canvas March 5.

RECOMMENDED PROBLEMS

Chapter 1*	1.4, 1.6, 1.8, 1.24
Chapter 2	2.4, 2.6, 2.17†, 2.22†, 2.24†, 2.27 2.38† 2.40, 2.88†, 2.93† 2.94†
Chapter 3	3.2, 3.3, 3.14†, 3.18†, 3.22, 3.24, 3.38†, 3.40† 3.42†, 3.64†, 3.70†, 3.72†
Chapter 6	6.2, 6.4, 6.6, 6.8, 6.10, 6.12, 6.18†, 6.20†
Chapter 7	7.2, 7.4, 7.6, 7.8
Chapter 8	8.2, 8.3, 8.4, 8.5, 8.6, 8.8, 8.10, 8.12, 8.16, 8.18†, 8.20†, 8.22†, 8.28, 8.30, 8.34, 8.36, 8.38, 8.40, 8.42
Chapter 9	9.9, 9.10, 9.13, 9.14, 9.15, 9.16, 9.18, 9.28, 9.30, 9.32, 9.33, 9.44, 9.46, 9.52, 9.53,9.54, 9.56, 9.58†, 9.60†
Chapter 10	10.1, 10.2, 10.8, 10.10, 10.12, 10.14, 10.16, 10.20, 10.22, 10.24
Chapter 13	13.4†, 13.8†, 13.10†, 13.16†, 13.22†, 13.26†, 13.28†, 13.42†, 13.46†, 13.48†, 13.54†, 13.58†, 13.62†
Chapter 14	14.4†, 14.6†, 14.14†, 14.16†, 14.26†, 14.28†, 14.40†, 14.42†, 14.49†

† Denotes a problem best worked using software. Most other numerical problems can be worked with software as an option.

* If you are new to Excel and/or Minitab it is recommended you review the Excel Guides or the Minitab Guides at the ends of certain chapters. For R and R Studio examples of analysis procedures can be seen at numerous websites.

Course Policies

Late Work Policy

There are no make-up opportunities for in-class assignments.

Extra Credit Policy

There are no opportunities for extra credit in this course. Students' focus should be on the primary work in the course.

Grades of "Incomplete"

An "I" grade may be awarded to a student when 1) arrangements are made prior to the end of the semester, 2) in the judgment of the instructor a valid reason is offered for granting an Incomplete, and 3) a clear path to a standard grade is agreed to by the instructor and the student which will result in successful completion of course requirements by the end of the succeeding semester. "I" grades not replaced by the end of the subsequent semester will be changed to "IF" and are a failing grade for the course.

Email

The primary means of communication between instructor and students between live class meetings will be email. "Blast emails" will occasionally be sent by the instructor to all students via Canvas. Students can feel free to email their instructor with questions at any time. Please anticipate a response time of 24 hours to email queries.

Canvas

Canvas will be used in this course to disseminate materials turn in weekly assignments and return graded assignments. If you need help learning how to perform various tasks related to this or other courses in Canvas, please consult the Canvas help guides. You may also contact USF's IT support at (813) 974-1222 or help@usf.edu.

Laptop Usage

Laptop/Tablet usage is encouraged in this course given the nature of the material.

Classroom Recording

Audio and/or video recordings of lectures are prohibited, as is the live streaming of lectures or dissemination of lectures via conference calling technologies.

Phone Usage

Students are asked to place their mobile phones on "silent" and to step outside the classroom to take any important calls.

Academic Integrity and Academic Misconduct

Academic integrity is the foundation of the University of South Florida System's commitment to the academic honesty and personal integrity of its university community. Academic integrity is grounded in certain fundamental values, which include honesty, respect, and fairness. Broadly defined, academic honesty is the completion of all academic endeavors and claims of scholarly knowledge as representative of one's own efforts. The final decision on an academic integrity violation and related academic sanction at any USF System institution shall affect and

be applied to the academic status of the student throughout the USF System, unless otherwise determined by the independently accredited institution. The process for faculty reporting of academic misconduct, as well as the student's options for appeal, are outlined in detail in USF System Regulation 3.027.

In our course assignments the professor has several methods for penalizing those who engage in academic misconduct. Among these methods the professor can 1) award 0 points for an assignment on which a student has engaged in misconduct, 2) award an F in the entire course, or 3) award a special FF grade in the course. An FF appears permanently on the student's transcript as a special designation showing the student failed the course for reasons of academic misconduct.

Disruption to Academic Process

Disruptive students in the academic setting hinder the educational process. Disruption of the academic process is defined as the act, words, or general conduct of a student in a classroom or other academic environment which in the reasonable estimation of the instructor: (a) directs attention away from the academic matters at hand, such as noisy distractions, persistent, disrespectful or abusive interruption of lecture, exam, academic discussion, or general University operations, or (b) presents a danger to the health, safety, or well-being of self or other persons.

Student Academic Grievance Procedures

The purpose of these procedures is to provide all undergraduate and graduate students taking courses within the University of South Florida System an opportunity for objective review of facts and events pertinent to the cause of the academic grievance. An "academic grievance" is a claim that a specific academic decision or action that affects that student's academic record or status has violated published policies and procedures or has been applied to the grievant in a manner different from that used for other students.

Disability Access

Students with disabilities are responsible for registering with Students with Disabilities Services (SDS) to receive academic accommodations. SDS encourages students to notify instructors of accommodation requests at least 5 business days prior to needing the accommodation. A letter from SDS must accompany this request.

Sexual Misconduct/Sexual Harassment Reporting

USF is committed to providing an environment free from sex discrimination, including sexual harassment and sexual violence (USF System Policy 0-004). The USF Center for Victim Advocacy and Violence Prevention is a confidential resource where you can talk about incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. This confidential resource can help you without having to report your situation to either the Office of Student Rights and Responsibilities (OSSR) or the Office of Diversity, Inclusion, and Equal Opportunity (DIEO), unless you request that they make a report. Please be aware that in compliance with Title IX and under the USF System Policy, educators must report incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. If you disclose any of these situations in class, in papers, or to me personally, I am required to report it to OSSR or DIEO for

investigation. Contact the USF Center for Victim Advocacy and Violence Prevention: (813) 974-5757.

Attendance Policy

Students are expected to exhibit professionalism through regular attendance and on-time arrivals to class lectures.

Religious Observances

All students have a right to expect that the University will reasonably accommodate their religious observances, practices and beliefs. If you observe religious holidays, you should plan your allowed absences to include those dates.

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