Dillard College of Business Administration

Syllabus: Advanced Applied Business Statistics

BUAD 5603, Section X20 and X21

Spring 2023

CONTACT INFORMATION:

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SYLLABUS CHANGE POLICY:

This syllabus is a guide for the course and is subject to change. All changes will be announced in class and students will be responsible for incorporating the changes into the syllabus. If, at some point, the university switches to an online format, then there will be significant changes in the manner in which exams are administered. Any exam taken online will be monitored through RESPONDUS, which will require students to have access to a webcam video.

COURSE MATERIALS:

Access to SAS OnDEMAND for Academics and to EXCEL

SAS University Edition was a free version of SAS, but you had to download software to create a virtual computer on your real computer, then download the SAS software, and finally, set up a way to read and write files from your "real" computer to the "virtual computer." This caused many people massive headaches (including this author).

The great news about SAS OnDemand for Academics (hence forth called **ODA – OnDemand for Academics**) is that you don't have to download anything! You access SAS on a cloud platform. Also, reading data from your real computer is quite simple. **ODA uses SAS Studio as the interface.** SAS Studio provides an environment that includes a point-and-click facility for performing many common tasks, such as producing reports, graphs, data summaries, and statistical tests. SAS Studio enables you to write and run your own programs.

Registering for ODA

To gain access to ODA, you need to register with SAS Institute. Part of the registration process is to create a SAS profile. If you already have a SAS profile, skip that portion of the instructions. To start, point your browser to: https://welcome.oda.sas.com

Required Text: A Gentle Introduction to Statistics Using SAS® Studio in the Cloud

978-1-954844-49-0 (Hardcover)
978-1-954844-45-2 (Paperback)
978-1-954844-46-9 (Web PDF)
978-1-954844-47-6 (EPUB)
978-1-954844-48-3 (Kindle)

RECOMMENDED Text:

Introductory Business Statistics: This text is Free online:
https://openstax.org/details/books/introductory-business-statistics
Publish Date: Nov 29, 2017 Web Version Last Updated: Jun 23, 2022
Hardcover: ISBN-10: 1-947172-46-8 ISBN-13: 978-1-947172-46-3
Paperback: ISBN-13: 978-1-50669-984-4
Digital: ISBN-10: 1-947172-47-6 ISBN-13: 978-1-947172-47-0

The text is designed to meet the scope and sequence requirements of the one-semester statistics course for business, economics, and related majors. Core statistical concepts and skills have been augmented with practical business examples, scenarios, and exercises. The result is a meaningful understanding of the discipline, which will serve students in their business careers and real-world experiences.

Anderson, Sweeney, and Williams: Statistics for Business and Economics, 5e 2009,
Thomson South-Western ISBN 13: 978-0-324-65421-9 ISBN 10: 0-324-65422-7
This text is designed to help students fully understand descriptive and inferential statistical analysis, its components, and its uses. Taking into consideration current statistical technology, its focuses demonstrating the logic, reasoning, and calculations that lie behind any statistical analysis. Furthermore, the text emphasizes the application of statistical tools to real-life business concerns.

OTHER ANCILLARY MATERIAL:
In addition to the two texts, students need to have access to the following:

- WebCam video
- Thumb drive:

Each student should have a thumb drive (USB) on which to keep various data sets and assignments that will be a part of each class. Projects and assignments may include the requirement that electronic versions of your work be submitted. If students have access to MSU-DCOBA labs, then downloading the SAS software is not necessary. SAS software is installed in most DCOBA labs.

Course Description
Taking into consideration current statistical technology, the course focuses on the use and interpretation of software, while also demonstrating the logic, reasoning, and calculations that lie behind any statistical analysis. Furthermore, the course emphasizes the application of statistical tools to real-life business concerns.
The course is structured around the most commonly used SAS statistical procedures. You will also learn how to test the assumptions for all relevant statistical tests. Major topics featured include descriptive statistics, one-and two-sample tests, ANOVA, correlation, linear and multiple regression, and analysis of categorical data.

Course Pre-requisites
BUAD 3033 or equivalent and consent of Graduate Coordinator.

LEARNING GOALS
A. General Learning Goals (GLC):

- The general objective of this course is to review and solidify the knowledge gained in undergraduate statistics course and enhance the ability to use statistical analysis in decision-making process.
- Problem solving and decision making abilities through critical analysis, evaluation and interpretation of business information. Problem solving skills and interpretation of results will be assessed exams and quizzes.
- Ability to use statistical Software **(with emphasis on SAS).**
- Ability to comprehend statistical discussions and comment on them.

General Learning Goals (GLC) associated with Assessment of Learning (AOL)

GLG3: Students will produce creative responses to business situations.
Objective: Our graduates will demonstrate the capability to critically analyze business situations and develop creative solutions to opportunities and problems.

GLG4: Our students will integrate knowledge across business disciplines.
Objective: Graduates will demonstrate the capability to integrate knowledge across business disciplines.

GLG5: Our students will communicate (in written form) at a professional level.

Objective: Graduates will be able to communicate in a professional business manner.

B. Course Specific Learning Goals:

- Summarize data using descriptive statistics.
- Understand the appropriate methodology for computing all statistical measures covered in this course.
- Apply basic statistical measure to the solution of structured business problems and interpret results.
- Understand the Ordinary Least Squares (OLS) model and its applications.
- Apply hypothesis testing to business problems and estimates of coefficients.

COURSE POLICIES:

A. Attendance Policy:

Students are expected to access all videos and taped lectures for this course. Many important announcements are provided for this course. You are expected to log into D2L a minimum of once daily to check for updates and announcements via postings and email. See the MSU university catalog for the University Class Attendance Policy.

B. Other Related Policies

Electronic Communication Devices

Use of personal electronic communication devices, other than through D2L, is discouraged during exams and students are required to disable any other electronic instruments during exams. Individuals holding devices that disrupt class may be asked to leave the class for the remainder of the session.

Expectation

Answers you provide in exams and case studies are expected to reflect logical reasoning, to be well articulated, including correct grammar and punctuation and to be clearly legible, in a manner and format that would be acceptable for a business report in a commercial setting. Students will be expected to develop a base knowledge in using SAS. Each student is expected to become sufficiently familiar with the Desire-2-Learn (D2L), as it will be a primary communication instrument for this class.

GRADING and EVALUATIONS:

A student's grade will be based on a weighted average of the following:

MAJOR EXAMS		40%
Exam I	20%	
Exam II	20%	
FINAL EXAM		30%
MANAGERIAL CASES		30%
Case Set I – Written Presentation	10%	
Case Set II – Written Presentation	10%	
Case Set III – Written Presentation	10%	

GRADE EVALUATION:

As a **percent** of total points (1000pts):
A (Above 90%), B (80-89%), C (70-79%), D (60-69%), F (below 60%)
Total Points:
[Exam Avg. X 4.0] + [Final X 3.0] + [Case Avg. X 3.0]

Major exams:
Two major exams will be given. Each exam will involve calculation and derivation of answers as well as their interpretation and meaning. Questions will come from the text and notes. **A significant portion of each exam involves interpreting output derived from SAS and EXCEL as well as from Managerial Cases.** Exams will be objective-type exams [TF or MC] monitored through RESPONDUS.

Failure to take an exam on the scheduled date without prior permission from the instructor will result in a zero for that exam. Failure to take any exam without prior approval will result either in an 'F' or 'I' (incomplete) for the course. If, because of a truly unavoidable situation, you are absolutely not able to take an exam at the scheduled time/date, it is your responsibility to contact your instructor well in advance to ask to take the exam early. If a real, legitimate, last minute emergency occurs, it is your responsibility to contact me before the exam begins.

SAS Programs:
Students are required to duplicate SAS output from the following three sets of figures from the text, A Gentle Introduction to Statistics Using SAS. The output for each set is due on each scheduled exam date. It is absolutely essential to have the individual assignments complete before each exam is administered. That is because several exam questions will be from the produced output. See attachment below for each exam requirements: **Required Output from A Gentle Introduction to Statistics Using SAS**

Final exam:
A comprehensive final exam will be given with greater emphasis on later material. This exam will be an objective-type exam [TF or MC] monitored through RESPONDUS.

Managerial Cases – Written Assignments:
Three Managerial Cases are required. The goal of each case is to correctly understand a business situation, solve a real problem, and make a good business decision. Designated cases with specific formatting guidelines are attached at the end of this syllabus. Statistical output for these cases will be generated using SAS. More detailed information about this requirement can be found in the attachment below:
Format for Managerial Case Writing Assignments

Lower Grades:
The instructor reserves the right to lower any student's final grade by a letter grade (i.e., A to B, D to F) for:
(A) A negative, rude, unreasonably argumentative or inattentive attitude in class, or,
(B) Repeatedly disrupting the class for any reason (tardiness), or,
(D) **NOT** showing respect for fellow classmates' questions, opinions, or class presentations.

Campus Carry:
Senate Bill 11 passed by the 84th Texas Legislature allows licensed handgun holders to carry concealed handguns on campus, effective August 1, 2016. Areas excluded from concealed carry are appropriately marked, in accordance with state law. For more information regarding campus carry, please refer to the University's webpage at Campus Carry Polices Link.

Academic Integrity:
With regard to academic honesty, students are referred to the "Student Honor Creed" of Midwestern State University Undergraduate Catalog, which may be found using the following MSU link: Link to Student Honor Creed.

Americans with Disabilities Act:
This class follows the guidelines suggested by the Center for Counseling and Disabilities Services for those students who qualify for disability services. See Midwestern State University Undergraduate Catalog which may be found at: Link to Suggested Guidelines Center for Counseling and Disabilities Services.

D2L:
The Midwestern State University D2L program will be incorporated into this class and will provide the primary default means of communication. Each student is expected to master the use of D2L. Assistance to achieve comfort using this program will be available as needed. Grades will be posted using D2L.

OTHER RELEVANT INFORMATION:
Midwestern State University Student Handbook:
See the most recent MSU Student Handbook for a statement of the university's policy on academic dishonesty. Any other questions not specifically addressed by this syllabus are governed by the student handbook.

Medical or Other Serious Problems:
Please take time and make the effort to advise me if you have difficulties that require my attention to properly evaluate your classroom participation and activities.

Tape Recordings and Cell Phones:
Tape recording of lectures is permitted. You may not tape record any information or class discussion when a graded test is being reviewed. Cell phones and pagers are prohibited unless the instructor has granted permission to have them in class.
Return of Exams:
Never download or take a photo of any exam or graded answer sheet. This will result in an automatic zero (0) on the exam.

Plagiarism Statement:
"By enrolling in this course, the student expressly grants MSU a "limited right" in all intellectual property created by the student for the purpose of this course. The "limited right" shall include but shall not be limited to the right to reproduce the student's work product in order to verify originality and authenticity, and educational purposes."

Correspondence
All correspondence regarding grades or class issues must be conducted through email using your **Midwestern State University (MSU) email or through D2L**. I will not return answers to questions to other email accounts and will not discuss grades or class standing over the phone. Since email or D2L messages are the most convenient means of communication, it is recommended that students use and regularly monitor their MSU email and D2L account. You must adhere to the following subject line of any message sent to me via text message or email: **BUAD 5603 First, Last Name.**

Netiquette: Communication Courtesy Code
Students are expected to follow rules of common courtesy in all email messages, class discussions, lecture hall posts, chats, etc. If I consider any of them to be inappropriate or offensive, I will forward the message to the Chair of the department and the online administrators and appropriate action will be taken.

Deadlines
Do not wait for the last minute to do any assignment. Check D2L for all assignments and the deadlines. Reply and check for replies on every email sent and received. The student is responsible for getting the work to me on time.

Spring Semester 2023 Schedule
https://msutexas.edu/registrar/_assets/files/pdfs/acadcal2223.pdf
MLK Birthday observed.....January 16

Classes begin.....January 17

Spring Break begins 5:00 p.m..... March 11 (March 13-18)

Classes resume..... March 20

Last Day for "W", 4:00 p.m. – Drops after this date will receive grades of "F." March 27

Holiday Break begins 10:00 p.m..... .....April 5

Classes resume..... ..... April 10

Last day of classes .... May 5

Final examinations begin ..... May 6

Course Schedule – Schedule is subject to change

Class	Class Coverage
Week01	Class Expectations and Requirements Descriptive and Inferential Statistics – Cody Study Designs – Cody
Week02	Data and Statistics Descriptive Statistics
Week-2	Descriptive Statistics
Week-3	Into to Probability Discrete Probability Distributions
Week-3	Continuous Probability Distributions
Week-4	Chap03 – What is SAS OnDemand – Cody Chap04 – SAS Studio Tasks – Cody
Week-4	Chap05 – Importing Data into SAS – Cody Chap06 – Descriptive Statistics – Cody
Week-5	Review for MGR Cases for Exam I
Week-5	Review for MGR Cases for Exam I
Week-6	**Exam I [8:00-10:00 pm]**
Week-6	Sampling and Sampling Distributions Interval Estimation
Week-7	Chap07 One-Sample Tests – Cody Chap08 Two-Sample Tests - Cody
Week-7	Chap11 Tests of Independence Chap14 – Analyzing categorical data – Cody
Week-8	Hypothesis Tests Analysis of Variance Chap09 Comparing More than Two Means – Cody
Week-8	Review for MGR Cases for Exam II
Week-9	Review for MGR cases for Exam II
Week-9	Review for MGR cases for Exam II
Week10	SPRING BREAK (March 11-18)
Week11	**Exam II [8:00-10:00 pm]**
Week11	Chap11 Correlation – Cody
Week12	Simple Regression
Week12	Simple Regression
Week13	Multiple Regression
Week13	Multiple Regression
Week14	Chap12 Simple and Multiple Regression - Cody
Week14	Review MGR Cases for Exam III
Week15	Review MGR cases for Exam III
Week15	Review MGR Cases for Exam III
Week16	Review MGR cases for Exam III
Week16	Review for Exam III
	Cases due by Midnight on Monday May 8, 2023
	Final Exam [8:00-10:00 pm] Tuesday, May 9, 2023

*All Dates are Tentative

Final Exam schedule can be found in the **Spring Schedule of Classes**. Please check the following link: https://msutexas.edu/registrar/_assets/files/pdfs/spring23finals.pdf

Format for Managerial Case Writing Assignments

- Each student is responsible for completing two designated Managerial Case Reports (see list below).
- Each case should include the following components:
  1. Statement of the problem
  2. Statistical Results
  3. Policy conclusions

  Append the following to each case:

  1. SAS Program used
  2. SAS Output referenced

- Use Microsoft's WORD processor, **with SAS inserts**, to complete this assignment.
- At the end of each case is an Assignment that students are to complete.
- Students are required to identify relevant variables, choose the appropriate analysis plan, produce correct results, interpret their findings and make recommendations regarding the managerial issues presented.
- Data sets for the various cases will be provided in the Contents section of D2L. Each case assignment should be based on the information provided in the case itself.
- Consult the two following articles for clarification about writing proper statistics reports:
  Teaching Students to Write About Statistics by Mike Forster
  An Approach to Report Writing in Statistics Courses by Glenda Francis
- Use one-inch margins throughout and either 10 or 12 character font.
- In addition to the three General Learning Goals (GLC) stated above, this assignment is graded on the basis of accuracy, relevancy, neatness, style, thoroughness, and punctuality, as well as on the professionalism of your WORD and SAS output.
- Significant penalties are assessed for late work.
- A drop box folder will be set up in D2L for you to submit your work.
- Missing even one case will entail severe penalties.
- Provide the following information at the beginning of each case:
  First, Last Name
  Case title (i.e., Circuit, etc,)
  Semester, Year
- The following cases, which can be found in your text (Business Cases in Statistical Decision Making), are required:
  Managerial Case Set I
  Select 1 of the following cases: Amtech, Plastiks, and Datastore.
  Managerial Case Set I
  Select 1 of the following cases: Keels, Circuit, and ServePro.
  Managerial Case Set III
  Select 1 of the following cases: Easton, Pronto, and Ryder.

  All Cases are due by _____ pm on ____, _____.

Required Output from <u>A Gentle Introduction to Statistics Using SAS</u>

1. Cody-Figure 4.13 – The Results Window –
2. Cody-Figure 4.14 – Displaying the Results in Browser Window
3. Cody-Figure 5.6 – Contents Grades.xlsx
4. Cody-Figure 5.19 – Edited Output from Import Task
5. Cody-Figure 5.28 – Listing of Data Set
6. Cody-Figure 6.8 - Histogram and Box Plot for MSRP
7. Cody-Figure 6.14 – Frequencies for the Variable Cylinders
8. Cody-Figure 6.19 – Distribution of Horsepower for cars with Four cylinders
9. Cody-Figure 6.22 – Box Plots Showing Horsepower for four- and six-cylinder Cars
10. Cody-Figure 6.22 – Box Plots Showing Horsepower for Four- and Six-Cylinder Cars

Exam I

11. Cody-Figure 7.7 – Tests for Normality
12. Cody-Figure 7.8 – t test Results
13. Cody-Figure 8.8 – Table for Assumptions of Variances
14. Cody-Figure 8.24 – Statistics, t- and p-values
15. Cody-Figure 14.10 – Table of gender by Median
16. Cody-Figure 14.11 – Measures of Association
17. Cody-Figure 14.16-17 – Odds Ratios and Relative Risks

Exam II

18. Cody-Figure 9.5 – ANOVA Table
19. Cody-Figure 9.6 – Box Plot by Method
20. Cody-Figure 9.9 – Least square Means
21. Cody-Figure 11.14 – Pearson and Spearman Correlations
22. Cody-Figure 11.14 – Pearson and Spearman Correlations
23. Cody-Figure 12.7 – First Section of Linear Regression Output
24. Cody-Figure 12.12 – Matrix of Scatter Plots
25. Cody-Figure 12.16 – Output Including the VIF
26. Cody-Figure 12.17 – Output from Model with Endurance Removed
27. Cody-Figure 12.17 – Output from Model with Endurance Removed
28. Cody-Figure 12.21 – Four Methods for Determining when to stop adding Variables
29. Cody-Figure 12.23 – Output Using Gender as a Predictor Variable
30. Cody-Figure 12.24 – Parameter Estimates for Gender and Strength

Final III