

Business Statistics (IS 322)

Syllabus – Spring 2022

Instructor: Dr. Trent McNamara

Lecture Times: MWF 9:00am – 9:50am @ MBB 317

Office Hours: MW 3:00pm – 4:00pm, or by appointment

Office: MBB 252

Email: tgm21a@acu.edu

Course Description

In this course, we cover a sequence of methods that allows us to turn data into interpretable and actionable business-related conclusions. This includes learning about different data types, how to collect it, and how to manage it. Following this, we learn how to descriptively analyze and present data using statistical software. We then focus on using data to make predictions about what will happen in the future. In summary, we will cover methods of sampling, uses of averages, construction of graphs, probability, distributions, hypothesis testing, and correlation and regression analysis.

Student Learning Outcomes

In *Business Statistics*, you will learn many of the basic tools that are used in professional and educational contexts to collect, manage, analyze, interpret, and present data. The components of this course ultimately culminate in students conducting and preparing a research paper of a study of their choosing. Among other skills, you will learn what data is, different types of data, its various sources, how to collect and manage it; how to construct and interpret tables and graphs that describe quantitative information; how to evaluate different business scenarios using quantitative techniques and measures; how to use statistical methods (regressions) to make predictions based on historical data; to logically think about questions, problems, and their solutions; will develop basic skills in using Excel spreadsheet software to conduct statistical investigations.

Course Contribution to Overall Business Perspective

Making logical decisions in business, industry, and government settings depends on two primary components. First, having a sound understanding of statistics and probability theory from which to frame questions and potential solutions. Second, having the technical abilities to acquire, prepare, and analyze data to form interpretable and actionable business-related conclusions. In *Business Statistics*, we combine both components under the same umbrella as we learn theory alongside its technical analysis. This course challenges students to think outside of the box, to turn qualitative observations into quantitative analysis, to assess both the values and limitations of data and various analytical techniques, and how to ethically report these aspects to a broader audience. As such, this course serves as a foundation for those interested in pursuing careers across a wide spectrum. This includes information systems, consulting, actuarial science, quality control, business and marketing research, and various aspects of financial and operations management.

Course Contribution to Christian Service and Leadership

Ever more than ever, data and statistics are central to the understanding of all business dimensions. Whether it be the manufacturing and production of a raw good, or end of year financial reports, quantitative analyses are heavily relied on to make important and life-changing decisions across all aspects. However, not all data and not all analytical techniques are created equal. While both have proven to be incredibly valuable in our modern world, both may come with various degrees of quality, biases, distortions, and limitations. This course provides students with the facilities necessary to discern the quality of quantitative information, to make appropriate and ethical choices and decisions based on such knowledge, and to act faithfully and responsibly on behalf of the organizations they serve.

The COBA Mission

“To educate students for Christian service and leadership throughout the world.” – ACU Mission

“To educate business and technology professionals for Christian service and leadership throughout the world.”
The COBA Mission Statement

We educate business and technology professionals for Christian service and leadership throughout the world. This mission is accomplished through:

- **Holistic student learning and development** – We seek spiritual, academic, and professional growth over the life of each student through exemplary teaching, experiential learning, and relationships with Christian faculty, professional staff, and engaged alumni.
- **Research and innovation** – We engage faculty, staff, and students in scholarly and practitioner research as well as innovation and entrepreneurship that impacts the university, academy, church, industry, and society.
- **Service and leadership** – We marshal the resources, gifts, and diversity of this Christian community to meaningfully serve and lead in the university, academy, church, industry, and society.

Text and Supplements

The following texts and classroom resources will be used in the course:

Text: Business Analytics Communicating with Numbers 1st Edition *by Jaggia, Kelly, Lertwachara, and Chen* (McGraw-Hill)
ISBN: 9781260784930

You need the Connect access code! Follow this [link](#) for information on setting up your Connect access.

Software: Microsoft Excel

Prerequisites

The prerequisite for this course is Math 130 (Finite Mathematics, or Business Math).

Grade Determination

Grades are determined by homework, three midterms, and a term paper. Final grades will be assigned A=[90-100], B=[80-90], C=[70-80], D=[60-70], F=[0-60]. Homework is worth 15% of your grade. It will be an online assignment and you will have unlimited attempts. The goal is for you to learn the material and make a good grade.

Each midterm is worth 20% of your grade. Midterms are comprehensive and will take place in class. Unless otherwise stated, no outside material will be allowed during exams. If you are scheduled to miss an exam due to a university-excused absence then you must notify me before 72 hours of the exam time and present written documentation in order to take an exam early. If you miss an exam due to a university-excused illness then you must notify me within 24 hours of the exam time and present written documentation. There will not be any make-up exams for these situations, but the final exam questions that come from the corresponding chapters missed can be used to replace exam scores. If you miss the final exam due to a university-excused illness then you must notify me within 24 hours of the exam time and present written documentation in order to schedule a makeup. If you miss an exam for any other reason, there will not be any make-ups.

Term Paper: A key component to this course is to develop a research paper analyzing a causal/correlational question. The term paper is worth 25% of your grade and is made up by several components that will be completed throughout the semester. These are listed, along with their weights, in the term paper rubric found on the class Canvas page. **All paper material is due at the beginning of lecture on its respective due date indicated in the course schedule below. Only hard-copy, printed material will be considered.** Students will be responsible for identifying a question (does “A” cause/impact “B?”), locating and obtaining the necessary data, cleaning the data set, creating visualizations that help summarize the data, and formalizing and estimating a regression that tries to answer the initial question. Some important things to keep in mind:

- Start simple. Think of questions as simply as possible (does “A” impact “B”). Then see what data is out ‘there.’
- Another option: find what data is out ‘there’ and think of how variables might be related.
- Obtaining data is required for this paper.
- You are welcome to develop questions in whatever field you want. My suggestion – write a paper on a topic you are interested in or an area you might see a future career in.
- While there are not any length requirements, a complete paper should contain 1) introduction, 2) literature

review, 3) description of data and summary statistics, 4) model specification, 5) empirical results, and 6) discussion/conclusion.

- While we will cover most of these steps over the course of the semester, you can begin today thinking about questions that you might want to research!

This course serves as a prerequisite for other courses in ACU's College of Business. If you are pursuing a degree in the College of Business, you must earn a grade of C or better in order for the course to satisfy the prerequisite requirement.

Attendance/ Late Assignments/Missed Exams:

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located online.

If a student accrues more than nine absences (20% of the class), the student will receive an "F" as a final grade. If for an extended period of time a student becomes too ill to engage the course material, the student and professor will work with SOAR to develop and plan that ensures the student's academic and physical well-being.

No late assignments will be accepted under any circumstances since they will be available online and can be completed at any time. If you are scheduled to miss an exam due to a university-excused absence then you must notify me before 72 hours of the exam time and present written documentation in order to take an exam early. If you miss an exam due to a university-excused illness then you must notify me within 24 hours of the exam time and present written documentation. There will not be any make-up exams for these situations, but the final exam questions that come from the corresponding chapters missed can be used to replace exam scores. If you miss the final exam due to a university-excused illness then you must notify me within 24 hours of the exam time and present written documentation in order to schedule a makeup. If you miss an exam for any other reason, there will not be any make-ups.

ADA Compliance Policy: Abilene Christian University is dedicated to removing barriers and opening access for students with disabilities in compliance with ADA and Section 504 of the Rehabilitation Act. The Alpha Scholars Program facilitates disability accommodations in cooperation with instructors. In order to receive accommodations, you must be registered with Alpha Scholars Program, and you must complete a specific request for each class in which you need accommodations. If you have a documented disability and wish to discuss academic accommodations, please call our office directly at (325) 674-2667 or email alpha@acu.edu. Alpha also houses tutors for this class. If you are struggling, get help early.

Anti-Harassment Policy: As a professor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a professor. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep the information you share private to the greatest extent possible. When I am not able to keep your information confidential, I will only share it with responsible administrators on campus who can provide you with services and resources. I am required to share with the Title IX Coordinator information regarding sexual misconduct or harassment, dating or domestic violence or stalking that you report to me. If you would prefer to share information in a confidential setting, I encourage you to speak with someone in the [ACU Counseling Center](#). All of your options are available for review by clicking on the [link](#) to ACU's policy.

Academic Integrity

COBA Honor Code

Objective: COBA faculty, staff and students will strive to proclaim in their lives competence, character and community. In joining COBA, students, faculty, and staff covenant to abide by the following ethical principles.

Competence: To lead and serve well requires competence. And to become competent requires diligence and hard work. We owe it to all who have prepared the way and who will follow in our footsteps, to be good stewards of opportunities and resources. Thus, in all you do: set priorities, seek excellence and professionalism in your work, satisfy requirements, and take responsibility for your learning and performance. You cannot build competence if you lie, cheat, steal, or tolerate those who do.

Character: A reputation of good character is built slowly through testing, yet can be destroyed in an instant by compromise or careless work, just as it can through injustice. Guard your character; it is worth more than a grade or promotion. "A

good name is more desirable than great riches; to be esteemed is better than silver or gold” (Proverbs 22:1). You cannot build character if you lie, cheat, steal, or tolerate those who do.

Community: A spirit of fellowship and mutual encouragement holds each community member accountable. Accountability leads to a healthy community through adequate preparations for the tasks at hand, respectful truthfulness in all situations, and adding value to the tasks at hand. As a community, we must hold each other accountable to the principles of competence, character, and community. You cannot build community if you lie, cheat, steal, or tolerate those who do.

COBA supports ACU’s Academic Integrity Policy (www.acu.edu/campusoffices/campuslife/acad_integrity.html). This important policy offers examples of academic infractions and a process for assigning consequences and voicing appeals. Ignorance of this policy is never an excuse. Individual instructors will define course specific definitions, however, in general you should avoid:

- 1) **Plagiarism** - Copying or even paraphrasing words or ideas from another source (including current or past students) without giving adequate credit.
- 2) **Lying** - Inventing data or sources or making false attributions about the origin of material or offering a deceptive reason for an absence or delay in the completion of academic work.
- 3) **Cheating** - Facilitating or participating in any process that circumvents the intent of any exam, test, quiz, paper, or assignment.

Any dishonest act observed or reported will be investigated and if proven, be reported in administrative offices and records, and may be subject to any or all of the following outcomes based on severity: 1) A zero for the assigned work, 2) A failing grade for the course, 3) Dismissal from the university

Tentative Class Schedule

Date	Topics and Due Dates*
M Jan 10	Syllabus and Introduction
W Jan 12	Chapter 1 – Introduction to Business Analytics
F Jan 14	Chapter 1 – Introduction to Business Analytics (Connect Survey Due)
M Jan 17	Martin Luther King Jr. Holiday
W Jan 19	Chapter 1 – Introduction to Business Analytics
F Jan 21	Writing a Paper
M Jan 24	Chapter 2 – Data Wrangling (HW1 Due)
W Jan 26	Chapter 2 – Data Wrangling
F Jan 28	Chapter 2 – Data Wrangling
M Jan 31	Chapter 2 – Data Wrangling: Lab
W Feb 2	Chapter 2 – Data Wrangling: Lab
F Feb 4	Chapter 3 – Visualization and Summary (HW2 Due)
M Feb 7	Chapter 3 – Visualization and Summary
W Feb 9	Chapter 3 – Visualization and Summary
F Feb 11	Chapter 3 – Visualization and Summary: Lab (Paper Proposal Due)
M Feb 14	Chapter 3 – Visualization and Summary: Lab
W Feb 16	Midterm #1 Review (HW3 Due)
F Feb 18	Midterm #1 (chapters 1 – 3)
M Feb 21	Paper Data and Visualization Discussion
W Feb 23	Chapter 4 – Probability
F Feb 25	Chapter 4 – Probability
M Feb 28	Chapter 4 – Probability
W Mar 2	Chapter 4 – Probability
F Mar 4	Chapter 5 – Statistical Inference (HW4 Due)
M Mar 7	Chapter 5 – Statistical Inference
W Mar 9	Chapter 5 – Statistical Inference
F Mar 11	Chapter 5 – Statistical Inference (Paper Visualization and Summary Due)
M Mar 14 – 18	Spring Break
M Mar 21	Midterm #2 Review (HW5 Due)

W Mar 23 F Mar 25	Midterm #2 Review Midterm #2 (chapters 4, 5)
M Mar 28 W Mar 30 F Apr 1	Paper Discussion Chapter 6 – Regression Analysis Chapter 6 – Regression Analysis
M Apr 4 W Apr 6 F Apr 8	Chapter 6 – Regression Analysis Chapter 6 – Regression Analysis Chapter 6 – Regression Analysis
M Apr 11 W Apr 13 F Apr 15	Chapter 6 – Regression Analysis: Lab Chapter 6 – Regression Analysis: Lab Good Friday
M Apr 18 W Apr 20 F Apr 22	Paper Discussion – Putting it all together (Paper Peer Review) (Paper Draft Due) (Paper Peer Review) (HW6 Due)
M Apr 25 W Apr 27 F Apr 29	Paper Office Hours – No Lecture Midterm #3 Review Midterm #3 Review (Final Paper Due)
M May 2 W May 4 – 6	Dead Day Final Exams – Midterm #3 (covers all course material)

***Due dates for homework are at 11:59pm on their listed day. Due dates for paper items are for the scheduled lecture meeting time.**