Business Statistics (IS 322)
Syllabus – Fall 2021

Instructor: Dr. Trent McNamara
Lecture Times: MWF 9:00am – 9:50am @ MBB 215
Office Hours: Monday 2:30pm – 3:30pm & Thursday 8:30am – 9:30am, or by Appointment
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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
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> *"To educate business and technology professionals for Christian service and leadership throughout the world.*"
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> 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. The term paper is worth 25% of your grade.

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.

Term Paper: A key component to this course is to develop a research paper analyzing a causal/correlational question. 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 a 1) cover page, 2) introduction, 3) literature review, 4) description of data and summary statistics, 5) model specification, 6) empirical results, and 7) 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!

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 miss an exam due to a university-excused absence then you must notify me within 48 hours and present written documentation in order to receive a make-up exam.

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-Harrassmennt 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	T0PICS
M Aug 23	Syllabus and Introduction
W Aug 25	Introduction to Business Analytics
F Aug 27	Introduction to Business Analytics
M Aug 30	Introduction to Business Analytics (CONNECT INTRO SURVEY)
W Sep 1	Writing a Paper
F Sep 3	Data Wrangling
M Sep 6	Data Wrangling (HOMEWORK #1 DUE)
W Sep 8	Data Wrangling
F Sep 10	Data Wrangling Example
M Sep 13	Data Wrangling Example
W Sep 15	Visualization and Summary
F Sep 17	Visualization and Summary (HOMEWORK #2 DUE)
M Sep 20	Visualization and Summary
W Sep 22	Visualization Example
F Sep 24	Visualization Example & Proposal
M Sep 27	Midterm #1 Review (HOMEWORK #3 DUE)
W Sep 29	MIDTERM #1
F Oct 1	Probability
M Oct 4	Probability (PAPER PROPOSAL DUE)
W Oct 6	Probability
F Oct 8	Probability
M Oct 4	Probability Example
W Oct 6	Probability Example
F Oct 8	Statistical Inference (HOMEWORK #4 DUE)
M Oct 11	Statistical Inference
W Oct 13	Statistical Inference
F Oct 15	Statistical Inference
M Oct 18	Statistical Inference
W Oct 20	Statistical Inference Example (PAPER DATA & VISUALIZATION DUE)
F Oct 22	Fall Break
M Oct 25	Statistical Inference Example
W Oct 27	Midterm #2 Review (HOMEWORK #5 DUE)
F Oct 29	MIDTERM #2
M Nov 1	Regression Analysis
W Nov 3	Regression Analysis
F Nov 5	Regression Analysis
M Nov 8	Regression Analysis
W Nov 10	Regression Analysis
F Nov 12	Regression Analysis Example
M Nov 15	Regression Analysis Example (PAPER DRAFT DUE)
W Nov 17	Term Paper Peer Review

F	Nov 19	Term Paper Peer Review (**HOMEWORK #6 DUE**)
M	Nov 22	Paper Office Hours – **No Lecture**
W	Nov 24 – 26	**Thanksgiving Break**
M	Nov 29	Paper Office Hours – **No Lecture**
W	Dec 1	Midterm #3 Review (**TERM PAPER DUE**)
F	Dec 3	Midterm #3 Review
M	Dec 6	**Dead Day**
W	Dec 8 - 10	Final Exams – **MIDTERM #3**