

ACU COLLEGE OF BUSINESS ADMINISTRATION
COURSE SYLLABUS
MKTG/IS 432.01: DATA MINING
MWF 10:00-10:50AM
SPRING 2020



Instructor: Dr. Ryan Jessup
Associate Professor of Marketing
College of Business Administration

Office Hours: MW: 1:30-3:30; T: 9:30-11,
1:00-2:30; Or By Appointment
None on Thurs or Fri

Office: 283 Mabee Business (BA)

Classroom: 317 Mabee Business (BA)

Office Phone: 325.674.2569

Email: ryan.jessup@acu.edu

*"To glorify God by creating a distinctively Christian environment in which excellent teaching, combined with scholarship, **promotes the intellectual, personal, and spiritual growth of business students**, and educates them for Christian service and leadership throughout the world."*

The COBA Mission Statement

To educate students for Christian service and leadership throughout the world.

The ACU Mission Statement

Course Description: this course is an introductory survey of the technologies used to uncover patterns and associations in large databases. While data mining techniques can be applied to various disciplines, this course specifically focuses on their use to improve business processes and performance. The course particularly addresses the how, when, why, and where of data mining, particularly in the marketing context. Topics include fundamental principles and comparative philosophies, concepts of digital and database marketing, techniques for description, prediction, classification, clustering, and association, and the effects of data quality, privacy, ethics and security in data mining practice. Applications will focus on various business problems and activities, such as fraud detection, market basket analysis, cross-selling, churn, market segmentation. Students will gain hands-on experience in using computer software to access and mine business data sets.

Contribution of Course to Overall Business Perspective: Today, data is being collected at an unprecedented rate in all fields. This abundance information is being fueled by the declining cost of storage media. In addition, business data is more multi-faceted and complex than ever before, and the quantities of interest are more highly interrelated. While the construction of large data repositories is important and valuable, the economic benefits of profit, efficiency, and productivity cannot be realized unless information can be extracted from the data and transformed into actionable knowledge. Fortunately, modern advances in computing now make it possible to implement and deploy data analysis algorithms and strategies that were heretofore impossible. *Data Mining* provides an entrée to the intellectual and computational processes of extracting information from multi-dimensional data and transforming it into knowledge that can lead to improved business performance.

Contribution of Course to Christian Service and Leadership: Data are ever present in today's fast paced business environment. From the boardroom to the manufacturing line to the human resources office to the advertising agency to the annual report, business men and women are constantly bombarded with data of assorted quality. They must be able to rapidly and authoritatively respond with appropriate decisions based on their ability to distinguish facts from fiction. Unfortunately, as often highlighted by the media, there are also countless ways and opportunities in business to distort data to make them appear more or less favorable than they really are. The focus of *Data Mining* is to provide the student with the facilities necessary to discern the quality and usefulness of data, to make appropriate and ethical choices and decisions based on derived information and observed relationships, and to act faithfully and responsibly on behalf of the organizations they serve. (*Proverbs 15:22 NIV: Plans fail for lack of counsel, but with many advisers they succeed. Ecclesiastes 9:11 NIV: The race is not to the swift or the battle to the strong, nor does food come to the wise or wealth to the brilliant or favor to the learned; but time and chance happen to them all.*)

Goals for Student Competency: Upon successful completion of this course you know how to:

- Communicate an understanding of the role of data mining in business and society
- Use and explain applicable data mining terminology
- Identify, compare, and contrast the primary data mining methods and techniques, and select techniques that are appropriate for specified problem settings
- Develop an understanding of what it means to be a data-driven marketer in an evolving digital economy
- Perform and execute basic data mining algorithms, computations, and calculations
- Use contemporary data mining software

Format: Class time will generally consist of lecture, class discussion, and experiential exercises. Being prepared for class (e.g., reading the assigned material) is expected. Expectations for outside of class involve timely completion of homework assignments, making blog entries and comments, and participation in group project meetings, and contribution to group effort.

Prerequisites: IS 322 (or other statistics class)

Text and Supplements:

- (1) Shmueli, G., Patel, N.R., & Bruce, P.C. (2010). *Data Mining for Business Intelligence*. Hoboken, NJ: Wiley.
- (2) Levitt, S.D., & Dubner, S.J. (2009). *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*. New York: Harper Perennial.

Grade Composition: Your grade will be computed on the following basis:

Activity	Value	Points
Exam 1	20%	200
Exam 2	20%	200
Exam 3	20%	200
Participation	10%	100
Assignments	10%	100
Blog Entries	5%	50
Research Project	15%	150

Grading System

Letter Grade	Semester Combined Average
A	90 or above
B	80 – 89
C	70 – 79
D	60 – 69
F	Below 60

There is no pre-established quota of As, Bs, Cs, etc. for this class.

Course Assignments and Policies:

- I. Exams
Each of the exams will be based on material covered since the previous exam. *There will be no make-up exams without prior approval.*
- II. Participation
Class participation is essential to the success of this learning experience and will be considered an important element in the evaluation process. This includes your presence in class and involvement in class discussion, a positive attitude, comments on blog entries, and completion of class assignments; your individual contribution to your team project will also

weigh heavily on your semester participation score. A participation score will be awarded based on attendance, preparedness, attentiveness and appropriate contribution to discussion and involvement in your group project. Thus, simple class attendance is not sufficient to qualify for full class participation credit.

III. Assignments

Homework will be assigned periodically. Unannounced quizzes may also be administered periodically. Each assignment will be weighted to contribute to the assignment grade total. No late work will be accepted except for unexpected excused absences (e.g., an illness for which you have a doctor's note). Unless otherwise noted, all assignments need to be turned-in in-person, not via dropbox. Print things the night before to avoid doing work but getting no credit for it.

IV. Blog Entries

Each student will be required to make 2 blog entries on the course weblog. The first blog entry should be on one of chapters 1-3 and the second entry should be from one of chapters 4-6 of *Freakonomics*. Additionally, you are expected to make intelligent comments on the entries of other students (a few on-topic comments will suffice – I want to see that you're thinking and interacting). Entries should adhere to the following:

(1) Contents

- a. Give an extremely brief summary of the chapter, particularly the components that you find most interesting
- b. Explain why you find it interesting
- c. Provide a critical evaluation of the chapter, e.g., did they take into consideration all necessary or relevant information? What might they have not considered that they should have?

(2) Length: the entry should be approximately 250 words (e.g., 1 double spaced page in 12 point Times New Roman font). Entries substantially longer or shorter will have points subtracted.

(3) Keywords: in order to insure that you receive credit, your entries must have the following keywords in the following form

- a. FirstName LastName, e.g.: Ryan Jessup
- b. Chapter i: e.g., Chapter 3
- c. Any other keywords relating to your topic (no more than 3 really)

V. Research Project

Each student will be part of a team consisting of approximately 4 members. Teams will be formed near the beginning of the semester. Each team member is expected to contribute equally to the project. The goal of the project is to give you the opportunity to analyze data that is of interest to you. You will be expected to find the data, determine how best to analyze it, successfully analyze it, and then report on your findings. (In certain cases I may provide teams with data to analyze.) For example, you may know a business owner (your boss or a family member) that has data you can analyze. Or, perhaps there is something you've always wanted to find out but never before had the opportunity or knowledge to run the proper analysis: this is your chance. The single most important criterion is to choose a project that interests you and your team-mates.

RESEARCH REPORT

Overall, make sure that your paper is consistent across sections and that all sections "fit" together. This is often difficult with group papers. However, spending some extra time to ensure that the paper is consistent and well-organized will really improve your paper. It is highly recommended that you assign one person to not write but rather edit the entire paper after it has been written.

Sample Format

Your research paper should not exceed 12 pages (double spaced) in length including text, tables, graphs, and references. However, an appendix may be used. Below is a sample format for your research paper. Make sure you include all of these sections at least somewhere in your research paper.

1. Title Page.
2. Abstract.
3. Introduction.
4. Methodology and Results.
5. Discussion.
6. References (if necessary).

Title Page

Title of paper (a real title- -not IS or MKTG 432 Group Project) and authors' names.

Abstract

In ½ to 1 page, you should present a clear and concise overview of your paper. Include a general description of your objectives, your major findings, and major suggestions that you make in the report. It should clearly position your paper for the reader. It is a summary of the major points in your paper. The abstract is the last portion of the paper that is written.

Introduction

In 1-2 pages you should identify and briefly describe why you are analyzing the data and what it is that you hope to determine. In the introduction, explain why your topic is interesting and important. You may need to cite relevant literature that discusses the topic under investigation.

Methodology and Results

In this section you should explain from where and how you obtained your data. Then you need to explain the analyses you ran and your findings based on the analyses. Provide text and graphical presentations of the data. This section should include data analysis. Charts, tables, graphs, and text should be used to effectively communicate your findings.

Discussion

Here, you are to discuss the implications of your findings. Answer the question: What do these findings mean? Also, offer suggestions for strategies relative to your chosen topic.

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.

Academic Integrity

Academic integrity is defined as academic work completed as assigned for each class by the individual or group responsible for the work. Violations of academic integrity and other forms of cheating involve the intention to deceive, mislead, or misrepresent and therefore, are a form of lying. Such actions are contrary to behavioral norms that flow from the nature of God. Academic misconduct includes, but is not limited to, the following: 1) Failing to give credit to sources used in a work in an attempt to present the work as one's own, 2) Submitting papers or projects obtained from another source (e.g., research service or club paper file) as one's own, 3) Falsifying information orally or in writing, and 4) Receiving, giving, or using unauthorized aid on an examination or quiz. Academic misconduct may result in, but is not limited to, a zero on the assignment and/or an F in the course. Additionally, the department chair, Dean of the College of Business Administration, and the Dean of Student Life will be notified. See the full university policy, including how to appeal a decision, by following this [link](#).

Anti-Harrasmennt 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.

Tentative Class Schedule

Wk	D	DATE	CLASS ACTIVITY	DUE
1	1	Mon Jan 13	Syllabus, Introductions	
1	2	Wed Jan 15	Intro: Why Study Data Mining?	Read DM Ch 1
1	3	Fri Jan 17	Overview of Data Mining Process	Read DM Ch 2
2	x	Mon Jan 20	HOLIDAY: MLK JR DAY	
2	4	Wed Jan 22	"	Read DM Ch 3
2	5	Fri Jan 24	Data Visualization	DUE: HW 1
3	6	Mon Jan 27	Dimension Reduction	Read DM Ch 4
3	7	Wed Jan 29	"	
3	8	Fri Jan 31	"	DUE: HW 2
4	9	Mon Feb 03	Evaluating Classification and Predictive Performance	Read DM Ch 5
4	10	Wed Feb 05	"	DUE: HW 3
4	11	Fri Feb 07	"	
5	12	Mon Feb 10	"	
5	13	Wed Feb 12	EXAM 1	DUE: HW 4
5	14	Fri Feb 14	Multiple Linear Regression	Read DM Ch 6; (F Ch 1)
6	15	Mon Feb 17	"	
6	16	Wed Feb 19	"	
6	17	Fri Feb 21	"	
7	18	Mon Feb 24	k-Nearest Neighbor	Read DM Ch 7; (F Ch 2)
7	19	Wed Feb 26	"	DUE: HW 5
7	20	Fri Feb 28	"	
8	21	Mon Mar 02	Naïve Bayes Classifier	Read DM Ch 8; (F Ch 3)
8	22	Wed Mar 04	"	DUE: HW 6
8	23	Fri Mar 06	"	
x	x	Mon Mar 09	HOLIDAY: SPRING BREAK	
x	x	Wed Mar 11	HOLIDAY: SPRING BREAK	
x	x	Fri Mar 13	HOLIDAY: SPRING BREAK	
9	24	Mon Mar 16	"	
9	25	Wed Mar 18	EXAM 2	DUE: BLOG POST 1; HW 7; Must have approval for group data analysis topic
9	26	Fri Mar 20	Classification and Regression Trees	Read DM Ch 9
10	27	Mon Mar 23	"	DUE: BLOG COMMENTS 1
10	28	Wed Mar 25	"	"
10	29	Fri Mar 27	"	
11	30	Mon Mar 30	Logistic Regression	Read DM Ch 10; (F Ch 4)
11	31	Wed Apr 01	"	DUE: HW 8
11	x	Fri Apr 03	workday (Dr. Jessup away)	
12	32	Mon Apr 06	"	
12	33	Wed Apr 08	"	
12	x	Fri Apr 10	HOLIDAY: GOOD FRIDAY	
13	34	Mon Apr 13	Neural Networks	Read DM Ch 11; (F Ch 5)
13	35	Wed Apr 15	"	DUE: HW 9;
13	36	Fri Apr 17	"	(Methods written)
14	37	Mon Apr 20	Cluster Analysis	Read DM Ch 15; (F Ch 6)
14	38	Wed Apr 22	"	DUE: HW 10;
14	39	Fri Apr 24	workday (with cheese!)	
15	40	Mon Apr 27	"	Read DM Ch 14
15	41	Wed Apr 29	Association Rules	DUE: HW 11
15	42	Fri May 01	"	DUE: BLOG POST 2; Research Paper
			EXAM 3: (See ACU Academic Schedule)	DUE: BLOG COMMENTS 2

Note: Certain events may necessitate the changing of this schedule. Abbreviations: DM = Data Mining textbook; F=Freakonomics book.