Department of Decision and Information Sciences

BZAN 6310, Quantitative Analysis for Business Decisions
Course Information
Fall 2021

Instructor: Dr. Ravi Aron — Email: raron@bauer.uh.edu
Office: 260F Melcher
Office hours: Wednesday 4:00 to 5:00 PM and/or by appointment — Office phone: 713.743.6246

***Required Text: Albright, S. C., and Winston, W.*, "Business Analytics: Data Analysis & Decision Making, 6th edition, Cengage Learning.**

Course Description:

Today companies collect vast amounts of data quite easily. But in their raw form, these data are usually meaningless. In order to make them meaningful, and hence useful, they must be analyzed for trends, patterns, relationships, and insightful information. This course covers a variety of statistical methods, from simple to complex, to help students analyze such data sets, uncover important information, and create models for predicting business outcomes. For example, you might learn how to develop a model that can predict which customers are most likely to abandon a subscription service or who is most likely to default on payments. In general, there is a heavy emphasis throughout the course on the fundamental concepts and theories of analytical methods that are useful in decision making. Though these methods vary, the objective to equip you with decision-making tools that you can apply in your business careers is the same. The methods are taught by an example-based approach. In this regard, emphasis will be placed on realistic business problems. The main software that is used for the adopted approach is ***Microsoft Excel with an Add-in called StatTools***, but you may also learn the use of other tools that are useful for quantitative analytics.

Teaching Methods:

1. **In Person Sessions:** Important material from the text and outside sources will be covered in class. Students should attend these sessions and participate in the proceedings. Discussion is encouraged and from time to time we may review, analyze, or discuss outside material relevant to the topics being covered.

2. **Online Synchronous Sessions:** Materials covered during these sessions will supplement and complement the material covered in the face-to-face sessions in class. We may also use some sessions to help you present solutions to structured business problems using analytical techniques. These will take the form of group presentations.

3. **Online Asynchronous Sessions:** Important concepts, conceptual frameworks and discussions of tools and techniques will be made available to students via these sessions. Students are required to make themselves fully familiar with the contents covered in these sessions. We will switch between different delivery mode as needed and in response to contingencies and situations that might arise.

4. **Assignments:** Tasks related to the conceptual frameworks learned in class will be assigned to groups of students. These assignments will consist of students using the techniques learned in the course to solve structured business problems and present the solutions.

5. **Exams:** Exams/Quizzes will be open book/note and will test material that is covered in the course. The final exam will be cumulative to the extent that it will include topics that are covered earlier in the course.

6. **Class Participation:** Students are strongly encouraged to attend the face to face and synchronous sessions and take part in the discussions in class. Students' original perspectives grounded in appropriate analytical frameworks on business problems (expressed in class), insightful responses to specific questions posed by the instructor, participation in class discussions that help raise and/or answer insightful questions all count toward the class participation grade. There are multiple different ways in which students may earn points for class participation. The instructor will be willing to evaluate ideas from students and offer feedback on appropriate means of earning class participation points.

   The instructor will call on students to answer questions in class. Students are required to come adequately prepared to class and be familiar with the reading materials assigned for each class.

   We may use the concept of a 'flipped classroom' in one or more class sessions, where some learning materials are made available via the blackboard and where we will use the synchronous sessions – face to face and/or online – for discussions and crafting applications to business problems.

NOTES ONLINE: You will have access to all material via the **Blackboard Learn** application.

- The lecture slides will be available in the CLASS NOTES section of the class web site. The slides posted within 24 hours prior to each class session. But, on a few rare occasions, I might make minor changes to them **just in time for our class**. Of course, I will make you aware of these changes in class.

7. **Announcements** regarding the class such as schedule changes, assignments, projects, and so on will be made in class during the in person and/or synchronous sessions as well as on the blackboard site. If you do not attend a session, then please be sure to check if there are announcements.

8. **Instructor's Office Hours:** The course is designed to leave us with strategic flexibility to deal with contingencies that may arise – pandemic related, weather, or some other unforeseen event. The instructor will therefore offer multiple formats for students to reach him during his office hours (and/or by appointment). Students may see the instructor in person, use zoom or other video conferencing mechanisms, or call the instructor by phone. Students are not restricted to contacting the instructor only during office hours; they are welcome to make appointments outside of the instructor's office hours.

9. **Contacting the Professor:** You can reach me by telephone or email. If you try to reach me, and you are unable to do so, then leave a message for me. I will try to get back to you within 48 hours.

10. **Teaching Assistant (TA):** The TA for this course is Karthik Thirupathi Sekar, a student in Industrial Engineering at the College of Engineering in UH. He can be reached at kthirupathisekar@uh.edu

11. **Grading:**

    1. Quiz 1: 10% of final grade
    2. Quiz 2: 15% of final grade
    3. Assignments: 25% of final grade.
    4. Exam: 40% of final grade
    5. Class Participation: 10% of final grade

    Final course letter grade follows the numeric-letter grade system used here at University of Houston.

Course Policies:

Missed Classes: The student is responsible for obtaining material, which may have been distributed through a variety of different methods. This can be done through contacting a classmate or by contacting the instructor during his office hours. Missed or late exams, quizzes cannot be made up under any circumstances, unless an officially acceptable reason is provided and is deemed to be consistent with Bauer

College's policies. **Any uncoordinated, unexcused missed quizzes, exams or other evaluation exercise will result in a score of 0 for that evaluation exercise.**

Assignments: The delivery schedule of completed assignments, and the mode of delivery will be specified ahead of time. You are required to be a part of a group with about 5 or 6 other students. All students that have enrolled in the course will be assigned to groups using a random number generating process. You will work with your group members on the assignments. The instructor may assign additional members to a group, remove members from a group, or change the composition of groups in response to contingencies that arise and for advancing the learning goals of students in the context of situations that may necessitate such interventions.

Toward the end of the semester, you will have an opportunity to conduct a peer evaluation of what each member of your group contributed to the work done. I will use the scores on these evaluations in an appropriate weighted fashion to determine each group member's final adjusted score for assignments.

Academic Dishonesty: Plagiarism and cheating are serious offenses and may be punished by failure on exam, paper, or project; failure in course; and or expulsion from the University. For more information, refer to the "Academic Dishonesty" policy in the University's Catalog. The University of Houston Academic Honesty Policy is strictly enforced by the C. T. Bauer College of Business. No violations of this policy will be tolerated in this course. A discussion of the policy is included in the University of Houston Student Handbook, http://www.uh.edu/dos/hdbk/acad/achonpol.html. Students are expected to be familiar with this policy.

Need for Assistance: If you have any condition, such as a physical or learning disability, which will make it difficult for you to carry out the work as outlined in this document, or which will require academic accommodations, please notify me as soon as possible. I will recommend that you contact the Center for Students with Disabilities. The contact person is Justin Dart in the CSD building #568, room 110. The numbers for the CSD office are Ph: 713-743-5400; TDD: 713-749-1527; Fax: 713-743-5396 or email: uhcsd@uh.edu.

Posting of Grades: Your scores will be posted on blackboard and where deemed necessary, they will be reported via other methods.

Tentative Lecture Outline

This outline is tentative. It may change in the event of unforeseen class disruptions. As such, it could be modified as time goes by. I have not specified here which sessions are going to be conducted face to face and which ones will be conducted online (synchronously or asynchronously). I have built strategic flexibility into the course design to deal with contingencies that may arise – pandemic related, weather, or some other unforeseen event. The default assumption for any session is that it will be delivered face to face in the classroom. As we make progress, I will update this document and specify the session level details.

No.	Date	Topic	Chapter
1	08/25	**Introduction to Course Expectations, Tools, and related issues**	
		Introduction to Data Analysis & Decision Making	**Chap One**
		• Modeling and Models	
		Describing the Distribution of a Single Variable	**Chap Two (Part I)**
		• Basic Concepts – Population, sample & data	
		• Descriptive measures for Categorical Variables	
		• Descriptive measures for Numerical Variables	
		• Summary measures	
		• Outliers and Missing values	

2 09/01 **Finding Relationships among Variables** **Chap Two (Part II)**

- Categorical & Numerical
- Scatter Plots
- Measures of Variation
- Correlation and Covariance

NO CLASS LABOR DAY WEEK

3 09/15 **Probability and Probability Distribution.** **Chap 3 & 4 (Part 1)**

- Correlation and Covariance
- Probability Essentials

QUIZ -1 Administered

4 09/22 **Advanced Concepts: Conditional Probability** **Chap 4 (Part II)**

- Distribution of Single Random Variable
- Conditional Mean and Variance
- Distribution of Two Random Variables
- Independent Random Variables

5 09/29 **Normal, Binomial, Poisson and Exponential Distribution** **Chap Five**

- The Binomial Distribution, BD
- Applications of BD
- Poisson & Exponential Distributions

6. 10/06 **Normal Distribution, ND** **Chap Five & Six**

- Applications of ND
- Poisson & Exponential Distributions

CLASS ASSIGNMENT – I ADMINISTERED

7. 10/13 **Sampling and Sampling Distribution** **Chap Seven**

- Methods for selecting random samples
- Introduction to estimation

Confidence Interval Estimation **Chap Eight**

- Confidence Interval for a Mean - 1
- Confidence Interval for a Proportion - 1

8. 10/20 **Confidence Interval Estimation** (continuation) **Chap Eight**

- Confidence Interval for a Mean - 2
- Confidence Interval for a Proportion - 2

9. 10/27 **Confidence Interval Estimation - 2** **Chap Eight**

- Working with examples: Mathematical Applications
- Confidence Interval for the Difference between Means
- Controlling CI length

10. 11/03 **Hypothesis Testing. (Part - I)** **Chap. Nine**

- Concepts in Hypothesis Testing
- Hypothesis Tests for a Population Mean
- Hypothesis Tests for other Parameters

- Test for Normality
- One-Way ANOVA

10. **Hypothesis Testing (Part – II)** **Chap. Nine**

- Test for Normality
- One-Way ANOVA

11. 11/10 **Regression Analysis: Estimating Relationships** **Chap. Ten**

- Scatterplots: Graphing Relationships
- Correlations: Indicators of Linear Relationships
- Simple Linear Regression – Theoretical Aspects
- Multiple Regression & Modeling possibilities – Theoretical Aspects

QUIZ -2 Administered

12. 11/17 **Regression Analysis: Statistical Inference** **Chap Eleven**

- Multiple Regression & Modeling possibilities
- Validation of Fit
- Statistical Model
- Inferences about Regression Coefficients
- Stepwise Regression

CLASS ASSIGNMENT II ADMINISTERED

NO CLASS THANKSGIVING

13. 12/01 **Review & Recap**

Final Exam – December 6 – 12

Please see 'Fall 2021: University of Houston Policies', overleaf

Fall 2021: University of Houston Policies

Face Covering Policy

To reduce the spread of COVID-19, the University strongly encourages everyone (vaccinated or not) to wear face coverings indoors on campus including classrooms for both faculty and students.

Presence in Class
Your presence in class each session means that you:

- Are NOT exhibiting any Coronavirus Symptoms that makes you think that you may have COVID-19
- Have NOT tested positive or been diagnosed for COVID-19
- Have NOT knowingly been exposed to someone with COVID-19 or suspected/presumed COVID-19

If you are experiencing any COVID-19 symptoms that are not clearly related to a pre-existing medical condition, do not come to class. Please see Student Protocols for what to do if you experience symptoms and Potential Exposure to Coronavirus for what to do if you have potentially been exposed to COVID-19. Consult the (select: Undergraduate Excused Absence Policy or Graduate Excused Absence Policy) for information regarding excused absences due to medical reasons.

Policy Guidelines for All Courses

COVID-19 Information
Students are encouraged to visit the University's COVID-19 website for important information including on-campus testing, vaccines, diagnosis and symptom protocols, campus cleaning and safety practices, report forms, and positive cases on campus. Please check the website throughout the semester for updates.

Vaccinations

Data suggests that vaccination remains the best intervention for reliable protection against COVID-19. Students are asked to familiarize themselves with pertinent vaccine information, consult with their health care provider. The University strongly encourages all students, faculty, and staff to be vaccinated.

Reasonable Academic Adjustments/Auxiliary Aids

The University of Houston complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, pertaining to the provision of reasonable academic adjustments/auxiliary aids for disabled students. In accordance with Section 504 and ADA guidelines, UH strives to provide reasonable academic adjustments/auxiliary aids to students who request and require them. If you believe that you have a disability requiring an academic adjustments/auxiliary aid, please contact the Justin Dart Jr. Student Accessibility Center (formerly the Justin Dart, Jr. Center for Students with DisABILITIES).

Excused Absence Policy

Regular class attendance (where applicable), participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including: medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

In the context of this course, note that quizzes, final exam, assignments, etc., are designed so that students have approximately one week to take these. Students are required to take the evaluation exercise (quizzes, final exam) in a single sitting. However, they can take it anytime in the period during which the test (quiz, final exam) is open. Therefore, being indisposed, or experiencing other constraints during a few days will not constitute a valid reason for missing a test (quiz, final exam). Evidence (as accepted by the university policies) will need to be produced that covers the entire period during which the test was open. The course has been designed so that students have full flexibility to take every test online and asynchronously anytime during the week (or so) that the test is open. Therefore, there may be very few acceptable reasons for missing a test and not taking it during the entirety of that period.

Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Justin Dart, Jr. Student Accessibility Center. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

Syllabus Changes

Due to the changing nature of the COVID-19 pandemic, please note that the instructor may need to make modifications to the course syllabus and may do so at any time. Notice of such changes will be announced as quickly as possible through announcements on blackboard and/or through e-mail notifications made via the Blackboard course e-mailing system.