Department of Decision and Information Sciences
BZAN 6350: Quantitative Foundation for Business Analytics
Spring 2025 (Section 18422)

Instructor: Dr. Briceon C. Wiley   **Email:** bw6310@central.uh.edu
Office hours: MW 12:00 – 2:30 PM in MH 275A   **Class meeting:** T 6 – 9 PM

COURSE INFORMATION

Description

Business Analytics refers to the use of a variety of techniques to analyze data and make predictions about future events or to discover meaningful patterns and rules. These techniques also relate to data mining, which one can think of as the process of extracting useful information from large data sets. As such, Business Analytics also focuses on developing new insights and understanding of business performance based on data and statistical methods. Some common business questions that one might address with Analytics are:

(1) Given a large list of prospective customers, which are most likely to respond to ad campaigns?
(2) Which customers are most likely to default on payments?
(3) Which customers are most likely to abandon a subscription service?
(4) What factors influence customers' decisions to subscribe or default?

This course covers a variety of techniques, from simple to complex, that can make it possible to answer these and other similar kinds of questions. There is a heavy emphasis throughout the course on the interpretation of results from analytical methods.

Corequisite

BZAN 6351 – *Basic Programming for Business Analytics*

Required Course Materials

Textbook:

> *Machine Learning for Business Analytics: Concepts, Techniques, and Applications in R* 2nd ed. by Galit Shmueli, Peter C. Bruce, Peter Gedeck, Inbal Yahav, Nitin R. Patel (ISBN: 9781119835172)

Computer and Software: You will need a laptop with the ability to run R and RStudio, which are free and widely available for download from the Comprehensive R Archive Network (CRAN) and Posit (formerly RStudio). These tools are compatible with Windows, macOS, and Linux operating systems, so any computer that meets these basic requirements will work for our class. Over the course of the semester, we will install and use various R packages to support our analyses. Your laptop will be essential for every class session, as we will work through data analysis exercises together. Hands-on practice is a critical part of the learning process, so be sure your computer is ready to run the necessary software.

COURSE METHODS

1. Readings. You will be expected to read the related material in conjunction with our class meeting each week. Though you do not have to read ahead, it is highly recommended you read the chapter **before** we meet so you are aware of what we are discussing and can receive any needed clarification.

2. Meetings. We will spend our three-hour meetings covering the week's topics. This will consist of a mixture of PowerPoint, discussion, and practice.

3. Homework. There will be homework assignments tied to each major topic of the course. Homework will be released as we finish a given topic and is due by 11:58 PM, CST, the week after it has been released.

4. Projects. Our class is split into three parts, and at the end of each part (roughly 1/3 of the way through the course), the class will spend a session working through a designated analytics problem that reviews the topics we covered prior to this point in time. The project will be assigned during class with an anticipated due date exactly one week later, before our next meeting.

5. Contacting the Professor. The best way to reach me is through email (bw6310@central.uh.edu). Please allow up to **two business days** for email responses. If you find you have trouble keeping up with homework or other aspects of the course, make sure to let me know as early as possible. Please be proactive in informing me when difficulties arise during the semester so I can help you find a solution as efficiently as possible. **Please refrain from contacting me through Teams, Canvas, or other non-email methods. I will only respond to emails that are sent to the address provided in this syllabus.**

GRADING

Item	Percentage
Homework	25%
Project 1	25%
Project 2	25%
Project 3	25%

Score	Letter Grade
95+	A
90 – 94.9999	A-
85 – 89.9999	B+
80 – 84.9999	B
75 – 79.9999	B-
70 – 74.9999	C+
65 – 69.9999	C
0 – 64.9999	C-*

* You will notice that the lowest achievable grade in this course is a *C-*. A student **cannot** fail this course **unless** they do not take part in one or more of our projects (a student must have a non-zero score on every project to earn a letter grade other than an *F* in this course).

COURSE GUIDELINES

This course emphasizes hands-on data analysis using the R programming language. While we will work through many examples and concepts together during class, becoming proficient in R—like learning any new language—requires consistent practice. Spending time outside of class experimenting with R, exploring its functions, and reviewing course materials will significantly enhance your understanding and confidence. R can seem challenging at first, but with regular use, it becomes an incredibly powerful tool for analysis and decision-making. Your dedication to practicing and exploring R will pay off, and I'm here to help if you run into any hurdles along the way!

Classroom Conduct: All students are expected to always behave in a professional and ethical manner. This includes, but is not limited to, the following:

- Joining class on time and staying until the end of the period. "Attending" class means not only being physically present but also engaged and actively participating in a positive way.
- Using legally licensed copies of the course software and textbook materials.
- Using your computer for class business ONLY, i.e., ***not for email, web surfing, messaging, etc.***
- Taking notes and paying attention during class so that you can ask meaningful questions.
- Working diligently outside of class time to solve the homework problems on your own.
- Strictly observing the university academic honesty policy at all times.

Missed Meetings: The student handles obtaining material. This can be done through contacting a classmate or by contacting the Instructor.

COURSE POLICIES

Mental Health and Wellness Resources:

The University of Houston has a number of resources to support students' mental health and overall wellness, including CoogsCARE and the UH Go App. UH Counseling and Psychological Services (CAPS) offers 24/7 mental health support for all students, addressing various concerns like stress, college adjustment and sadness. CAPS provides individual and couples counseling, group therapy, workshops and connections to other support services on and off-campus. For assistance visit uh.edu/caps, call 713-743-5454, or visit a Let's Talk location in-person or virtually. Let's Talk are daily, informal confidential consultations with CAPS therapists where no appointment or paperwork is needed. The Student Health Center offers a Psychiatry Clinic for enrolled UH students. Call 713-743-5149 during clinic hours, Monday through Friday 8 a.m. - 4:30 p.m. to schedule an appointment. The A.D. Bruce Religion Center offers spiritual support and a variety of programs centered on well-being.

Need Support Now? If you or someone you know is struggling or in crisis, help is available. Call CAPS crisis support 24/7 at 713-743-5454, or the National Suicide and Crisis Lifeline: call or text 988, or chat 988lifeline.org.

Academic Honesty Policy:

High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The UH Academic Honesty Policy is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

Title IX/Sexual Misconduct:

employee" for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the Title IX website at https://uh.edu/equal-opportunity/title-ix-sexual-misconduct/resources/.

Reasonable Academic Adjustments/Auxiliary Aids:

The University of Houston is committed to providing an academic environment and educational programs that are accessible for its students. Any student with a disability who is experiencing barriers to learning, assessment or participation is encouraged to contact the Justin Dart, Jr. Student Accessibility Center (Dart Center) to learn more about academic accommodations and support that may be available to them. Students seeking academic accommodations will need to register with the Dart Center as soon as possible to ensure timely implementation of approved accommodations. Please contact the Dart Center by visiting the website: https://uh.edu/accessibility/ calling (713) 743-5400, or emailing jdcenter@Central.UH.EDU.

<u>Excused Absence Policy:</u>

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston <u>Undergraduate Excused Absence Policy</u> and <u>Graduate Excused Absence Policy</u> 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 <u>military service</u>, <u>religious holy days, pregnancy and related conditions</u>, and <u>disability</u>.

<u>Recording of Class:</u>

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 <u>Justin Dart, Jr. Student Accessibility Center</u>. 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.

<u>Resources for Online Learning</u>

The University of Houston is committed to student success, and provides information to optimize the online learning experience through our <u>Power-On</u> website. Please visit this website for a comprehensive set of resources, tools, and tips including: obtaining access to the internet, AccessUH, and Canvas; using your smartphone as a webcam; and downloading Microsoft Office 365 at no cost. For questions or assistance contact <u>UHOnline@uh.edu</u>.

<u>UH Email</u>

Please check and use your CougarNet email for communications related to this course. Faculty use the CougarNet email to respond to course-related inquiries such as grade queries or progress reports for reasons of FERPA. To access your CougarNet email, <u>login</u> to your Microsoft 365 account with your CougarNet credentials. Visit <u>University Information Technology (UIT)</u> for instructions on how to connect your CougarNet e-mail on a mobile device.

Security Escorts and Cougar Ride

UHPD continually works with the University community to make the campus a safe place to learn, work, and live. The security escort service is designed for the community members who have safety concerns and would like to have a Security Officer walk with them, for their safety, as they make their way across campus. Based on availability either a UHPD Security Officer or Police Officer will escort students, faculty, and staff to locations beginning and ending on campus. If you feel that you need a Security Officer to walk with you for your safety, please call 713-743-3333. Arrangements may be made for special needs.

Parking and Transportation Services also offers a late-night, on-demand shuttle service called "Cougar Ride" that provides rides to and from all on-campus shuttle stops, as well as the MD Anderson Library, Cougar Village/Moody Towers and the UH Technology Bridge. Rides can be requested through the UH Go app. Days and hours of operation can be found at https://uh.edu/af-university-services/parking/cougar-ride/.

Syllabus Changes

Please note that the instructor may need to make modifications to the course syllabus. Notice of such changes will be announced as quickly as possible through Canvas and email.

Religious Holy Days:

The University of Houston respects the religious observances of students even though they may conflict with university class meetings, assignments, or examinations as outlined in the University of Houston Student Handbook. Potential conflicts with assignment due dates and examinations must be discussed with the instructor **within the first week of class** to be eligible for scheduling changes.

Makeup Policy:

According to University Policy, a makeup examination will be administered only if the instructor is furnished with written evidence that a student is:

   a. Participating in an activity appearing on the University Authorized Activity List and must be preceded by authorized, written, notice.
   b. Confined to home or bed by physician on account of illness.
   c. Bereaved by a death in his/her immediate family.
   d. Participating in legal proceedings that require his/her presence.

If you miss an exam due to a valid excuse as listed above, **you must notify the instructor as soon as possible but no later than 24 hours after the scheduled exam** and provide written evidence as soon as possible. Otherwise, you will not be allowed to take a makeup exam and you will receive a grade of ZERO (0) for that exam.

COURSE SCHEDULE

WK	Date	Topics	HW Due
1	1/14	Introduction and Getting Established	1/20
2	1/21	Chapter 2: Overview of the Machine Learning Process	1/27
3	1/28	Chapter 3: Data Visualization	2/3
4	2/4	Chapter 4: Dimension Reduction	2/10
5	2/11	Chapter 5: Evaluating Predictive Performance	2/17
6	2/18	Project 1 Workday	2/24
7	2/25	Chapter 6: Multiple Linear Regression	3/3
8	3/4	Chapter 7: k-Nearest Neighbors	3/17
9	3/11	**Spring Break**	
10	3/18	Chapter 9: Classification and Regression Trees	3/24
11	3/25	Chapter 10: Logistic Regression	3/31
12	4/1	Project 2 Workday	4/7
13	4/8	Chapter 15: Association Rules and Collaborative Fitting	4/14
14	4/15	Chapter 16: Cluster Analysis	4/21
15	4/22	Chapter 21: Text Mining	4/28
16	4/29	Project 3 Workday	5/5

IMPORTANT NOTE:

➢ The information and dates given in this syllabus may be subject to change.