Course	MIS 7397 / 4397 – Predictive Analytics & Business Intelligence
Department	Decision and Information Sciences
Term	Fall 2023
Meetings	Online Asynchronous Lectures

Instructor:	Leila Hosseini
Email:	lhosseini@uh.edu
Office:	MH #290D
Office Hours:	Virtual Meetings on Tuesdays 5:00PM-6:00PM (MS Teams Link); Or by appointment, please send me an email to schedule your meeting.

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The information contained in this course syllabus is subject to change anytime. Students are expected to be aware of any additional course policies presented by the instructor during the course. Changes to the course schedule or content will be announced through the Canvas announcement.

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Prerequisites

- Completion of BZAN 6310/6320 (or equivalent statistics course) with a grade of "B" or better.
- Undergraduate section MIS 4397 requires STAT foundation course with a grade of "B+" or better.

Course Description

There is a booming trend for businesses to leverage Business Intelligence (BI) with enterprise information assets to facilitate decision making and automate operations. This trend has been perpetuated in part by the proliferation of tools that support data analysis and automation by big companies. This course provides an overview of best BI practices through targeted reading, experiential learning, and assignments. Students will learn experientially by working with cutting-edge BI products to develop BI implementations for a simulated business assignment. This course is strictly interested in predictive analysis. Mathematical expressions of algorithms and large-scale projects are outside the scope of this course.

Value of the Course

For a variety of reasons—including the low cost of storage, technologies to capture data and ease of use of analytical tools—considerable effort is now being expended in most corporations to gain competitive advantage via business intelligence. Thus, some grasp of the fundamental business intelligence models coupled with hands-on experiences of state-of-the-art BI software tools will be of great benefit to almost any imminently graduating business student.

Course Objectives

The primary course goals are for the student to be able to do the following when they have completed the course:

- Be able to explain what the terms Predictive Analytics and Business Intelligence encompass and how they fit into the business—also its potential and limitations.
- Understand the principles underlying data mining (DM) tools.

- Be able to adequately determine correct data mining tools to apply to data.
- Be able to run data mining projects; analyze and interpret the results—and make management recommendations based on their findings.

Required Hardware & Software

1. Extensive computer use is expected on this course.
2. This course focuses on demo BI and DM concepts through SAS Enterprise Miner.
3. The SAS Enterprise Miner software that we use in this course works on **Windows** and **Linux** operating systems.
4. Download a contract form from Canvas with my signature (**Do Not** share this form with anyone outside this course), please send completed and signed form to UH IT (software@uh.edu).
5. Microsoft Office Excel and Word are expected to handle assignments and report submission.

Required Reading

- Daniel T. Larose and Chantal D. Larose, **Discovering Knowledge in Data: An Introduction to Data Mining**, 2nd Edition, Wiley, 2014. ISBN: 978-0-470-90874-7 (hardback)

Recommended Reading

- Foster Provost and Tom Fawcett, **Data Science for Business: What You Need to Know About Data Mining and Data-Analytic Thinking**, O'Reilly, 2013. ISBN: 978-1-449-36132-7.

Teaching Methods

- **Pre-recorded Lectures:** Important materials from the textbook and outside sources will be covered. This coverage will be mostly in the form of concept explanation and hands-on problem solving. Students should plan to take careful notes on topics that are presented by the instructor in lecture videos. Each topic in this course contains two sections. The first section covers the discussion about the theoretical guidance of BI and predictive analysis. The second section provides practice (use cases) and demos.

- **Assignments:** Problems and readings are routinely assigned to help support and supplement materials found in the textbook. Assignments must be turned in on time to receive the maximum points possible. Late submissions are not acceptable.

- **Exams:** Exams / quizzes will test assigned readings and materials. The final exam (i.e., Exam#2) will not be cumulative, but may require a good understanding of some fundamental concepts covered in previous exams.

- **Course Website:** Canvas is the official distribution channel for course materials. Please use Canvas for downloading materials including pre-recorded videos, reading materials, dataset, assignments instructions, final project instructions, and submitting assignments,

final project, and exams, etc. It is assumed that students know how to access the content on Canvas. The link for our course Canvas website is: https://canvas.uh.edu/courses/5742

- **Project Description:** The class project will give you an opportunity to apply most of the techniques you learned on this course. I will make available to you a set of data on which your project is based. The data will be what we consider "big." You will be required to get an understanding of the variables in your data set. You will use the software applications for the course to perform various analytics techniques on your data. In your project, you will attempt to show how well you can apply the techniques, understand the problems, and solve them using appropriate techniques. You will need to interpret all your results and provide managerial recommendations to help a stakeholder make good business decisions, which you will also define.

Note: All course materials and course activities will be released each Wednesday afternoon.

Grading

Grading Scheme

Grade Component	Points
Assignments	**20%**
Midterm Exam (i.e., Exam#1)	**25%**
Final Exam (i.e., Exam#2)	**25%**
Project	**30%**
Total	**100%**

Final course letter grade follows the numeric-letter grade system shown in the table below.

Scoring

Final Point Total	Letter Grade
> or = 92	**A**
> or = 89, but < 92	**A-**
> or = 86, but < 89	**B+**
> or = 83, but < 86	**B**
> or = 80, but < 83	**B-**
> or = 77, but < 80	**C+**
> or = 74, but < 77	**C**
> or = 70, but < 74	**C-**
> or = 67, but < 70	**D+**
> or = 63, but < 67	**D**
> or = 60, but < 63	**D-**
< 60	**F**

Course Policies

- **Missed Exams:** Makeup exams present a number of logistical challenges. Out of fairness to all students taking the course, makeup examinations will only be given in accordance with the official University policy. Exceptions are granted at the instructor's discretion and are typically limited to extreme circumstances such as documented hospitalization. If a student is permitted to take a make-up exam, the instructor reserves the right to substitute an alternate exam with different content. Any uncoordinated, unexcused missed exam will result in a score of 0 for that exam.

- **Assignments:** All assignments are due at the designated time on the due date, as noted in the course schedule. Late submissions are not acceptable. All assignments will be submitted via Canvas. I do *not* accept assignments via email. If you submit an incorrect assignment or need to resubmit your assignment on Canvas, you will be allowed to resubmit as long as it is before the due date. Only the latest one submission would be considered for grading. No extra credit assignments are available.

- **Final Project:** Once team members are assigned, you need to interact with them actively to complete the final project by the specified due date in the course schedule. The MS Teams, Zoom, and UH email are recommended tools for collaboration.

- **A Note on Regrade Requests:** The instructor will make every effort to return exam/assignment grades within 1 week of submission. If you believe that your grade is inaccurate, you may request a regrade under the following conditions:

  - Regrade requests must be submitted within 1 week of the date when the grade was returned.
  - For assignment grades, regrade requests must be emailed to the instructor or TA and must outline the reasons you deserve a higher grade. Referencing another student's grade is inappropriate and irrelevant. While we do our best to apply an even standard across students, we can't discuss anyone else's grade with you, so we need to deal with the merits of your particular case.
  - For exam grades, regrade requests must be made during office hours.
  - I reserve the right to regrade the entire assignment/project/exam, and thus your grade may go up or down.

- **Contacting the Professor and/or Teaching Assistant (TA):** UH email will be the most productive channel of communication to receive many fast responses to help resolve the majority of inquiries. Last-minute questions about deadlines, late submissions, etc., are not guaranteed to receive responses on-time to help resolve the issue, and you will be responsible for any negative consequences.

- **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 Honesty Policy" accessible here (http://www.uh.edu/provost/policies/honesty/). 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. 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@central.uh.edu. Also available to you is Counseling and Psychological Services (CAPS), which can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. In addition, there is no appointment necessary for the "Let's Talk" program, which is a drop-in consultation service at convenient locations and hours around campus. http://www.uh.edu/caps/outreach/lets_talk.html.

Inclement Weather or Technical Problems

In case of inclement weather or technological problems that prevent the University from providing access to course materials you may contact the instructor by sending an email. In addition, the instructor will notify students as soon as possible in such instances and provide instructions on how the course will proceed.

Course Schedule, Assignments, and Due Dates

This is a tentative class schedule; changes to the schedule will be posted on Canvas as an announcement.

Week # (First Day of Week)	DESCRIPTION	Required Chapter Reading	Tasks Due
WEEK 1 (08/21/2023)	Course Overview	Chapter 1	
WEEK 2 (08/28/23)	Data Preprocessing ▪ Understand data ▪ Summarizing data and visualization	Chapter 2 Chap 13.1	
WEEK 3 (09/04/2023)	Exploratory Data Analysis (EDA)–Part I	Chapter 3	**Install SAS Suite by Friday, 09/01/23**
WEEK 4 (09/11/2023)	Exploratory Data Analysis (EDA)–Part II	Chapter 3	**Assignment 1 Assigned**
WEEK 5 (09/18/2023)	Modeling the Data ▪ Supervised vs unsupervised model ▪ Model evaluation ▪ Over-fitting, cross-validation	Chapters 6 and 14.2	**Assignment 1 Due (Wednesday: 09/20/23, 11:59pm)**
WEEK 6 (09/25/2023)	Supervised: K-Nearest Neighbor Algorithm	Chapter 7	**Assignment 2 Assigned**
WEEK 7 (10/02/2023)	Supervised Model: Decision Trees–Part I	Chapter 8	**Assignment 2 Due (Wednesday: 10/04/23, 11:59pm)**
WEEK 8 (10/09/2023)	Supervised Model: Decision Trees–Part II		**Final Project Team-up Due (Wednesday: 10/11/23, 11:59pm)** **Assignment 3 Assigned**
WEEK 9 (10/16/2023)	Supervised Model: Regression Model	Chapters 5.6-5.12, 9, 13.2, 13.4, 13.5	**Assignment 3 Due (Wednesday: 10/18/23, 11:59pm)** **Assignment 4 Assigned**
WEEK 10 (10/23/2023)	Model Evaluation and Deployment ▪ Scoring the prediction	Chapters 14, 13.1, 13.2, 13.4, 13.5	**Assignment 4 Due (Wednesday: 10/25/23, 11:59pm)**
Exam #1 (Saturday: 10/28/23, 3:00PM-4:30PM)			
WEEK 11 (10/30/2023)	Unsupervised Model: Clustering Analysis–Part I	Chapter 10	
WEEK 12 (11/06/2023)	Unsupervised Model: Clustering Analysis–Part II		**Assignment 5 Assigned**
WEEK 13 (11/13/2023)	Unsupervised Model: Association Analysis	Chapter 12	**Assignment 5 Due (Wednesday: 11/15/23, 11:59pm)** **Assignment 6 Assigned**
WEEK 14 (11/20/2023)	**Thanksgiving Holidays – No Classes Held**		
WEEK 15 (11/27/2023)	Closing Remarks		**Assignment 6 Due (Wednesday: 11/29/23, 11:59pm)**
Final Project (Monday: 12/04/23, 11:59pm)			
Exam #2 (Saturday: 12/09/23)			