

## MIS 7397 / 4397 – Predictive Analytics & Business Intelligence

Fall 2022 – Online Asynchronous Lectures

**Room:** Online Asynchronous Sessions (Blackboard)

**Instructor:** Dr. Keran Zhao (“Keran” is pronounced as /key-ran/, or simply go by “KZ”)

**Office hours:** By appointment via Zoom (Please check the announcement for available time slots)

**Office:** MH #290D

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**Communication Zoom:** <https://uh-edu-cougarnet.zoom.us/j/96202089622>

*Note: when you make an appointment via email, please kindly add **[MIS 7397/4397]** to the subject line of the email. This will allow me to respond to your email faster.*

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The information contained in this syllabus is subject to change anytime. Students are expected to be aware of any additional course policies presented by the professor during the course.

Changes to the course schedule or content will be announced through (1) the **email address** you have registered in Blackboard. By default, this is your UH email address. You may change your registered email address if you wish. You are responsible for checking whatever email address is registered in Blackboard for class communications and updates. (2) the **Blackboard announcement**.  
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### Prerequisite:

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.

### 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

### 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.

### Software Requirement:

Extensive computer use is expected in this course. This course will focus on demo BI and data mining concepts through Orange3, SAS Enterprise Miner, and Python (optional). Microsoft Office Excel and Word are expected to handle assignments and report submission.

## Class Module Q&A

1. *Where and when to find the course materials?*

All the materials including pre-recorded video, reading materials, dataset, and project files are archived in the folder *Course Content* – Blackboard course page -> Course Content on the left panel. The syllabus can be found in the *Course Syllabus* folder.

All materials and course activities will be released each Wednesday 2 PM CT.

2. *How to get help?*

(1) Email – you may simply send KZ an email ([krzhao@uh.edu](mailto:krzhao@uh.edu)) with your questions and screenshot. I will try to get back to you within 24 hours. (If not, please feel free to send me a reminder, friendly)

(2) Office hour – you may send KZ an email with some proposed time slots (e.g., Tuesday morning, Friday afternoon after 4 PM, or in 30 mins). KZ will confirm the time slot and use the communication Zoom for a discussion.

3. *How to submit homework/project reports/quizzes?*

*Homework* is listed under the *Course Activity* panel on the left menu. You may find more details including the instruction, deadline, and submit button under specific assignments.

Project should be submitted via the *Final Group Project* (color-coded in blue). One team member can submit the report on behalf of the entire team.

Quizzes (exams) will be displayed under the *Exam/Quiz* folder based on the tentative schedule.

4. *How to collaborate on the final project?*

Once team members are assigned, you will find your teammates' information under the *Final Project Teams*. Using Microsoft Teams is recommended for collaboration. Other options include Slack, GitHub, Blackboard Discussion Board, emails, Zoom, and (definitely NOT) social media.

*“The playing field is poised to become a lot more competitive, and businesses that don't deploy AI and data to help them innovate in everything they do will be at a disadvantage.”*

- Paul Daugherty, Chief Technology and Innovation Officer, Accenture

## 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 will provide 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.

Each lecture 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.

### Tentative Course Schedule:

(#Week) First Day of week	Agenda	Reading	Milestone
1 08/22	Intro to course <ul style="list-style-type: none"> <li>- Overview, requirements</li> <li>- The data mining process</li> </ul> Demo <ul style="list-style-type: none"> <li>- Environment setting</li> </ul>	Chapter 1	Exercise: Install Orange3 and SAS suite
2 08/29	Data Preprocessing <ul style="list-style-type: none"> <li>- Understand data</li> <li>- Summarizing and visualization</li> </ul> Demo <ul style="list-style-type: none"> <li>- Orange3 data preprocessing</li> </ul>	Chapter 2 Chapter 13.1	- <b>Open: HW1</b> (Due 09/14 11:59 PM)
3 09/05	Exploratory Data Analysis (EDA) Data Visualization	Chapter 3	
4 09/12	Exploring the Data <ul style="list-style-type: none"> <li>- Exploratory Data Analysis (EDA)</li> <li>- Data visualization</li> </ul>	Chapter 3	- <b>Due: HW1</b> (Due 09/14 11:59 PM) - <b>Open: HW2</b> (Due 09/28 11:59 PM)
5 09/19	Modeling the Data <ul style="list-style-type: none"> <li>- Supervised vs unsupervised model</li> <li>- Model evaluation</li> <li>- Over-fitting, cross-validation</li> <li>- Classification: K-Nearest Neighbor Algorithm</li> </ul>	Chapter 6,7, 14.2	
6 09/26	Classification: Decision Trees <ul style="list-style-type: none"> <li>- Decision tree algorithms</li> </ul>	Chapter 8	- <b>Due: HW2</b> (Due 09/28 11:59 PM)
7 10/03	Regression Model  Neural Networks 1	Chapter 5.6 – 5.12 Chapter 9 Chapter 13.2-13.5	- <b>Due:</b> <b>Final Project Team-up</b> (Due 10/02 11:59 PM)
8	Material for Quiz #1 review on		

10/10	Blackboard Neural Network 1 (cont'd)		
9 10/17	Quiz #1: 10/22 (Saturday), 2PM – 3:30PM Neural Network 2 Model performance	Chapter 9	- <b>Open: HW3</b> (Due 11/02 11:59 PM)
10 10/24	Model Evaluation and Deployment - Scoring the prediction	Chapter 14 Chapter 13.2 – 13.5	
11 10/31	Unsupervised Model: Clustering Analysis - K-Means Clustering Algorithm	Chapter 10	- <b>Due: HW3</b> (Due 11/02 11:59 PM) - <b>Open: HW4</b> (Due 11/16 11:59 PM)
12 11/7	Unsupervised Model: Association Analysis - Market basket analysis	Chapter 12	
13 11/14	Closing remarks		- <b>Due: HW4</b> (Due 11/16 11:59 PM)
14 11/21	Final project discussion		
15 11/28	TBD		- <b>Due:</b> <b>Final Project</b>
16 12/5	Quiz #2: Date TBD		

**Course requirements:**

Students are expected to read the recommended textbook and to attend the class prepared to discuss assigned material. Regular class time will be split between the discussion of readings and in-class experiential learning assignments.

The grade in this course will be based on four assignments, one final project, one final exam, and class participation as follows:

Homework assignments (4)	20%
Quiz #1	25%
Quiz #2	25%
Final project	30%

e.g.,

Final total =

$$(100 (HW1) + 90 (HW2) + 100 (HW3) + 90 (HW4))/4*0.2 + 90 (project)*0.3 + 100(Quiz\#1)*0.25 + 80(Quiz \#2)*0.25 = 91$$

For the final project, students will prepare a report that addresses a business problem. Topics may vary across individuals.

## Grading Scale

Grade	Percentage
A	91.5 to 100
A-	88.5 to 91.49
B+	85.5 to 88.5
B	82.5 to 85.49
B-	79.5 to 82.49
C+	76.5 to 79.49
C	69.5 to 76.49
D	60 to 69.49
F	Below 60

## Ground Rules

**Honor Code:** This course and its associated coursework are being administered under the policies of the University of Houston (UH) C.T. Bauer College of Business Code of Ethics and Professional Conduct. All students are expected to respect and uphold this code. Information regarding this code is available on the University/College website. Violations of this Code will be addressed to the full extent allowed by university policy.

**Assignments:** Unless otherwise stated, all assigned work is due no later than the due date and time given on the Blackboard assignment. Assignments turned in after the day and time on which they are due are subject to a 20% reduction in grade. Assignments turned in more than 24 hours after they are due are subject to a grade of 0. If you have a legitimate excuse for missing a deadline, you should notify KZ *in advance of the deadline*.

**Missed Exams:** Missed or late exams cannot be made up under any circumstances unless an official excuse is provided by the Professor in advance. Any uncoordinated, unexcused missed exam will result in a score of 0 for that exam.

**Office Hours:** I will be glad to help around any time (recommended: 10 am to 1 am on weekdays) outside of class by appointment.

## College Policies

### COVID-19 Information

Students are encouraged to visit the University's [COVID-19](#) website for important information including diagnosis and symptom protocols, on-campus testing, and vaccine information. 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](#) and to 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](#).

#### Excused Absence Policy

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 [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](#).

#### 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 email and Blackboard announcement.