Kuwait University
College of Business Administration
Information Systems & Operations Management
Department

Course Syllabus

ISOM 440 – Business Data Mining – Spring 2026
Dr. Abdullah Alhouli

Lecture Time and Location:

Section (10A)	Sunday-Tuesday-Thursday	4:00 PM – 4:50 PM	Room C2 1003

Contact Information:

Location:	ISOM Department
Email	Abdullah.Alhauli@ku.edu.kw
Office	2nd Floor, Office: A2 – 1017
Office Hours	Sunday and Wednesday: 3:00 PM – 3:45 PM, (or by appointment)
Teaching Assistant	Hessa Alhoumaidan
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Textbook	Shmueli, G., Bruce, P. C., Yahav, I., Patel, N. R., and Lichtendahl Jr, K. C. (2017). **Data mining for business analytics: concepts, techniques, and applications in R**. John Wiley & Sons.
Course Website	Moodle + Microsoft Teams
Software	The software we will use for this book is R (together with the RStudio IDE). This is widely used in industry and has the advantage of being open source (hence, free).

Install R and RStudio

1) Download the R installer from https://cran.r-project.org/
2) Click on the link for your operating system.
3) Wait until the R installer has finished.
4) Download RStudio:
   https://rstudio.com/products/rstudio/download/#download

Course Description:

This course is designed to introduce the principles and practices of data mining and machine learning within a business context. It is tailored for those aspiring to deepen their understanding and skills in data-driven decision-making. Emphasizing practical application, the course delves into the tools and techniques essential for business analytics. A special focus is placed on classification and prediction methodologies, crucial for unraveling complex business challenges.

Throughout the course, students will encounter a variety of business scenarios ranging from Marketing and Finance to Healthcare and Operations. These real-world examples serve to illustrate the wide-reaching implications and applications of data analytics in the business sphere. By the end of this course, students will be equipped with the knowledge and skills to apply data mining techniques in a strategic, informed manner, enabling them to contribute significantly to data-driven business strategies.

COURSE LEARNING OBJECTIVES (CLOS):

The learning outcomes for this course, listed below, relate to the learning goals of the College of Business Administration Undergraduate Program. Upon successful completion of the course, students will be able to:

CLO1. Understand various data mining techniques.
CLO2. Differentiate between business situations for applying different data mining techniques.
CLO3. Select and apply appropriate data mining tool for solving business problems.
CLO4. Evaluate the performance of data mining solutions.
CLO5. Leverage data mining tools to make informed managerial recommendations for businesses.

CLO MAPPING TO CBA SKILL BASED COMPETENCY GOALS[1]

CLO	Competency Goal				
	Analytical	Communication	Information Technology	Business Ethics	General Business Knowledge
1					R
2					R
3	A		I		
4	A		I		
5	A	A			

Note: 'I' indicates Introduce, 'A' indicates Apply, and 'R' indicates Reinforce

[1] CBA Competency Goals can be found at the end of this document

COURSE OUTLINE

Topic	Key Topics
An Introduction to Data Mining Process	- What is data mining? - Core ideas in data mining - Terminology and notation - Overview of different DM techniques
Data Exploration and Dimension Reduction	- Data Visualization - Dimension Reduction
Performance Evaluation	- Evaluating Predictive Performance - Judging Classifier Performance
Prediction and Classification Methods	- Multiple Linear Regression k-Nearest Neighbors (kNN) - Classification and Regression Trees - Logistic Regression - Neural Nets
Mining Relationship Among Records	- Association Rules and Collaborative Filtering - Cluster Analysis
Forecasting Time Series (Optional)	- Handling Time Series - Regression-Based Forecasting
Data Analytics (Optional)	Text Mining

GRADING AND COURSE REQUIREMENTS

Weight	Category	Description
10%	Lab Exercises	At the lab
20%	Assignments	A total of five case assignments
25%	Midterm	Date: TBA
5%	Final Presentation	Due Date: TBA
10%	Final Project Draft	Due Date: TBA
30%	Final Exam	Date/Time: Tuesday 19/5/2026 From 9 to 11 AM
100%		

GRADE DISTRIBUTION

Grade	Range
A	≥ 95
A-	≥ 90 and < 95
B+	≥ 87 and < 90
B	≥ 83 and < 87
B-	≥ 80 and < 83
C+	≥ 77 and < 80
C	≥ 73 and < 77
C-	≥ 70 and < 73
D+	≥ 65 and < 70
D	≥ 60 and < 65
F	< 60

Important Dates

Date	Event
TBA	Midterm
TBA	Project Presentation
TBA	Final Project Draft
Thu. 7/5/2026	Last Day of Classes
Tue. 19/5/2026	Final Exam

INDIVIDUAL ASSIGNMENTS

- Five individual assignments are due. Each assignment will be posted on Moodle.

- Each individual assignment typically consists of a set of problems requiring the application of analytical tools discussed in class.

- While it is acceptable to discuss aspects of the homework and solution strategy with others, your submission should represent your own work. For instance, it would be acceptable to ask for help if you keep getting an error message in R, but it would be unacceptable to take someone else's R script, run it, and report the results. When in doubt, ask me.

- Assignments are to be submitted on Moodle. Late submissions will receive zero points.

LAB EXERCISES

There are individual lab exercises. These exercises need to be submitted through Moodle by 11:59 PM on the due dates. Late submission is not accepted.

TEAM PROJECT

Team Project, Report, and Presentation

- Each team of students will work on a data analysis problem involving real data. The project will focus on data mining methods, and will be carried out throughout the semester.

- I will assist you in choosing a feasible problem and dataset, so please discuss possible topics with me. Each team should obtain an "OK" from me regarding the scope and nature of the dataset and intended analysis. In order to get this OK, you should submit a short descriptive write-up by the date specified in the schedule. Guidelines for this document will be provided at a later date.

- Each group will meet with me once for 15-20 minutes in my office hours to discuss their progress on the project and get some feedback. We will schedule these meetings a few weeks into the semester.

- A presentation session is scheduled for the last week of class. This is a team activity.

- You are encouraged to be creative in designing your presentation. A typical presentation has about 10-12 PowerPoint slides.

- A final professional report is to be submitted. Guidelines for this report will be provided at a later date.

MIDTERM AND FINAL EXAM

There is one midterm exam in this course and a final exam. The topics included in these exams will be announced in class. The exams may be open book, open notes – but no laptops or computers are allowed. A calculator may be helpful.

CLASS ETIQUETTE

You are expected to attend every lecture and be actively engaged. A successful class is a collective enterprise and requires a shared commitment to creating a positive learning environment. In particular:

- All electronic devices (cell phones, iPads, etc.) must be switched off.
- Use of laptops is restricted to performing classroom exercises. Other uses – such as doing assignments for another class, sending email, and surfing the web – are unacceptable.
- Talking with others – even to discuss class material – is a serious distraction and must be avoided.

ATTENDANCE

Attendance in this class is required. Absences and late attendance will negatively affect your in-class experience. At the beginning of each lecture, I will take attendance. It is your responsibility to seek out help from classmates to fill you in on missed materials. For online sessions, you are expected to attend the live meetings that we will have on MS Teams. Failing to do so will lead to counting you as absent for a given class session.

University regulations governing absenteeism are applied to all students. This involves a first warning after 3 hours, a second warning after additional 3 hours absence and a failure notice for any absence beyond the 6 hours.

Every student in this course must abide by the Kuwait University Policy on Attendance (published in the student bylaws). A copy of the student bylaws can be accessed online on:

http://vpaa.ku.edu.kw/ar/documents/KU%20ByLaws/Students/Curriculum_Regulations.pdf

SPECIAL NEEDS

If you have a disability and/or special needs, you should bring this to my attention as soon as possible, **but not later than the second week of class**.

CBA COMPETENCY GOALS

1. <u>Analytical Competency:</u> A CBA graduate will be able to use analytical skills to solve business problems and make a well-supported business decision.

Student Learning Objectives:

1.1. Use appropriate analytical techniques to solve a given business problem.

1.2. Critically evaluate multiple solutions to a business problem.

1.3. Make well-supported business decisions.

2. <u>Communication Competency:</u> A CBA graduate will be able to communicate effectively in a wide variety of business settings.

Student Learning Objectives:

2.1. Deliver clear, concise, and audience-centered presentations.

2.2. Write clear, concise, and audience-centered business documents.

3. <u>Information Technology Competency:</u> A CBA graduate will be able to utilize Information Technology for the completion of business tasks.

Student Learning Objectives:

3.1. Use data-processing tools to analyze or solve business problems.

4. <u>Ethical Competency:</u> A CBA graduate will be able to recognize ethical issues present in business environment, analyze the tradeoffs between different ethical perspectives, and make a well-supported ethical decision.

Student Learning Objectives:

4.1. Identify the ethical dimensions of a business decision.

4.2. Recognize and analyze the tradeoffs created by application of competing ethical perspectives.

4.3. Formulate and defend a well-supported recommendation for the resolution of an ethical issue.

5. <u>General Business Knowledge:</u> A CBA graduate will be able to demonstrate a basic understanding of the main business disciplines' concepts and theories.

Student Learning Objectives:

5.1. Acquire a fundamental understanding of knowledge from the main business disciplines (e.g. finance, accounting, marketing, and management information systems, among others).