

# ISOM 3360: Data Mining for Business Analytics

## Spring 2026

Course Name	Data Mining for Business Analytics
Course Code	ISOM 3360, 3 Credits
Instructor	Yi Yang, ISOM
Contact	Office: LSK 4041 Email: <a href="mailto:imyiyang@ust.hk">imyiyang@ust.hk</a> <b>Begin subject: [ISOM3360] ...</b>
Office Hours	By appointment
Course Schedule and Classroom	Lecture (L2): TuTh 09:00AM - 10:20AM, Rm 1010, LSK Bldg Lecture (L3): TuTh 04:30PM - 05:50PM, Rm 1011, LSK Bldg  LA1 Mo 03:00PM - 03:50PM, G005, LSK Bldg LA2 Mo 09:00AM - 09:50AM, G005, LSK Bldg LA3 Th 09:00AM - 09:50AM, G005, LSK Bldg LA4 We 01:30PM - 02:20PM, G005, LSK Bldg
Course Webpage	Accessible from Canvas
Teaching Assistant	Ray PANG, <a href="mailto:imncpang@ust.hk">imncpang@ust.hk</a>
TA Office Hours	By appointment

### 1. Course Overview

This course will change the way you think about data and its role in business.

Businesses, governments, and individuals create massive collections of data as a byproduct of their activity. Increasingly, decision-makers rely on intelligent technology to analyze data systematically to improve decision-making. In many cases, automating analytical and decision-making processes is necessary because of the volume of data and the speed with which new data are generated.

In virtually every industry, data mining has been widely used across various business units such as marketing, finance and management to improve decision making. In this course, we discuss specific scenarios, including the use of data mining to support decisions in customer relationship management (CRM), market segmentation, credit risk management, e-commerce, financial trading and search engine strategies.

The course will explain with real-world examples the uses and some technical details of various data mining techniques. The emphasis primarily is on understanding the **business application** of data mining techniques, and secondarily on the variety of techniques. We will discuss the mechanics of how the methods work only if it is necessary to understand the general concepts and business applications. You will establish analytical thinking to the problems and understand that proper application of technology is as much an art as it is a science.

The course is designed for students with various backgrounds -- the class **does not** require any

technical skills or prior knowledge.

After taking this course you should:

1. Approach business problems data-analytically (intelligently). Think carefully & systematically about whether & how data can improve business performance.
2. Be able to interact competently on the topic of data mining for business intelligence. Know the basics of data mining processes, techniques, & systems well enough to interact with business analysts, marketers, and managers. Be able to envision data-mining opportunities.
3. Be able to identify the right BI techniques for various business problems. Gain hands-on experience in using Python and get ready for the job positions that require familiarities with the data analytics.

## 2. Lecture Notes and Readings

- Course Materials

All courses' materials (Lecture slides, assignments, and lab handouts) are available on Canvas course website.

- Supplemental books (optional):
  - ✧ *Data Mining for Business Analytics: Concepts, Techniques, and Applications in R*, by Galit Shmueli, Peter C. Bruce, Inbal Yahav, Nitin R. Patel, Kenneth C. Lichtendahl, ISBN: 1118879368
  - ✧ *Data Science for Business: What you need to know about data mining and data-analytic thinking*, by Foster Provost, Tom Fawcett, O'Reilly Media, 2013 ISBN: 1449361323
  - ✧ *Learning Data Mining with Python*, by Robert Layton, ISBN: 1787126781
- Software: *Anaconda Navigator (for Win-64, OSX-64, and Linux-64)*
  - ✧ Jupyter notebook, Python 3

## 3. Requirements and Grading

Your grades will be determined based on lab participation, homework assignments, group project, midterm exam, and final exam.

Component	Percentage
Lab	5%
Class Attendance/Participation	10%
Homework Assignments (3)	10%
Group Project	15%
Midterm Exam	28%
Final Exam	32%

#### 4. Important Notes on the Lab Session

This is primarily a lecture-based course, but lab participation is an essential part of the learning process in the form of active practice. You are **NOT** going to learn without practicing the data analysis yourselves. During the lab session, I will expect you to be entirely devoted to the class by following the instructions. And you should actively link the empirical results you obtained during the lab to the concepts you learned in the lectures.

During the lab session, you will gain hands-on experience with Python - a popular programming language for programming beginners.

#### 5. Homework Assignments, Term Project and Exams

There will be a total of **3 individual** homework assignments, each comprising questions to be answered and hands-on tasks. Completed assignments must be handed in via Canvas prior to the start of the class on the due date. Assignments will be graded and returned promptly.

Turn in your assignments early if there is any uncertainty about your ability to turn it in on the due date. Assignments up to 24 hours late will have their grade reduced by 25%; assignments up to one week late will have their grade reduced by 50%. After one-week, late assignments will receive no credit.

You are expected to finish a term project. The term project is a teamwork, which means you need to first form a team. Each team includes up to 4 students. In this project, you will apply the data mining techniques you learned in the class to solve real-world problems. The deliverable is a written report summarizing what you have done and what you have achieved. More details will be provided later.

This course will have two closed-book exams. The midterm exam will test issues covered in the first half of the course. The final exam will cover the classes in the second half of the course. Review sessions will be scheduled to help you prepare for these examinations.

The midterm exam is tentatively scheduled on **March 20 (7:00-8:30pm)**. Let me know as early as possible if there is any unavoidable conflict. The final exam will be held during the final examination period; the date will be announced later in the semester.

**Make-up exam policy:** <https://registry.hkust.edu.hk/resource-library/examination-regulations-student>

To quote, "If students wish the University to take into account illness or some other extenuating circumstances that have affected their performance in an examination, or ability to attend an examination, or to complete other assessment activities, they must report the circumstances of the case in writing and provide appropriate documentation to ARR, Academic Registry within one week of the scheduled date of the assessment activity. The Academic Registrar will review the case and make a recommendation to the relevant Dean or the Dean's designee."

#### Academic Integrity

Students at HKUST are expected to observe the Academic Honor Code at all times (see <http://acadreg.ust.hk/generalreg.html> for more information). Zero tolerance is shown to those who are caught cheating on any quiz or exam. In addition to receiving a zero mark on the quiz or exam involved, the final course grade will appear on your record with an X, to show that the grade resulted from cheating. This X grade will stay with your record until graduation. If you receive another X grade, you will be dismissed from HKUST.

## Tentative Lecture Schedule

Date	Topics	Deadlines (Tentative)
Feb 3	Course Overview	
Feb 5	Machine Learning Basic Concepts	
Feb 10	Data Preparation	
Feb 12	Decision Tree Learning	
Feb 17	<b>[No Class] Lunar New Year's Day</b>	
Feb 19	<b>[No Class] Lunar New Year's Day</b>	
Feb 24	Decision Tree Learning Continued	
Feb 26	Classification Model Evaluation	
Mar 3	Classification Model Evaluation Continued	
Mar 5	Linear Regression	
Mar 10	Regression Model Evaluation	
Mar 12	Logistic Regression	
Mar 17	Neural Network	
Mar 19	Midterm Review	
Mar 24	<b>[No Class] Midterm Exam 7:00PM-8:30PM</b>	
Mar 26	<b>Project Meeting</b>	
Mar 31	Natural Language Processing	
Apr 2	Association Rule Learning	
Apr 7	<b>[No class] Mid-Term break</b>	
Apr 9	k-means Clustering	
Apr 14	Dimension Reduction	
Apr 16	k-nearest Neighbor	
Apr 21	<b>Project Meeting</b>	
Apr 23	Recommendation Systems	
Apr 28	Ensemble Learning	
Apr 30	Compute Vision	
May 5	Time Series and Spatial Forecasting	
May 7	Final Exam Review	