The Hong Kong University of Science and Technology

UG Course Syllabus

Spring 2026

Decision Analytics for Modern Society

IEDA1280

3 Credits

Name: Xuan QIU

Email: xuanqiu@ust.hk

Course Description

This course introduces key concepts, methods, and applications of decision analytics to optimize decision-making in modern society. Students will explore how to make informed decisions under constraints, plan for future actions, manage risks, and interact strategically with others. The course also emphasizes strategies for succeeding in a dynamic and uncertain world by providing the tools and techniques needed to address complex and evolving challenges. Students will apply these analytical tools to solve practical problems and improve outcomes effectively.

Intended Learning Outcomes (ILOs)

By the end of **this co**urse, students should be able to:

1. Translate real-world problems into quantitative models.
2. Apply fundamental decision analytics techniques across various contexts.
3. Analyze tradeoffs between cost, risk, and flexibility under constraints and uncertainty.
4. Develop structured decision-making processes by applying analytical tools tailored to domain-specific requirements and constraints.

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessments:

Assessment Task	Contribution to Overall Course grade (%)	Schedule*
Homework assignments	10%	Week 4, 5, 11, 14
In-class activities	10%	Week 7, 12
Mid-Term	35%	23 March 2026
Final examination	45%	University Exam Week

*Please check the updated due dates of homework assignment submissions on canvas

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Homework Assignments	ILO2, ILO3	Homework assignments evaluate students' ability to apply decision analytics techniques in diverse application contexts to formulate and solve decision problems, and critically examine the tradeoffs among cost, risk, and flexibility under realistic constraints and uncertainty in these decision settings.
In-class activities	ILO2, ILO3	This task enriches students' knowledge of principles and approaches in decision analytics to apply in solving practical problems.
Midterm Exam	ILO1, ILO2, ILO3, ILO4	The midterm exam assesses students' ability to understand key theories and concepts of decision analytics and to model and solve real-world decision problems, evaluate cost–risk–flexibility tradeoffs under constraints and uncertainty, and design structured decision-making processes for different application contexts.
Final Exam	ILO1, ILO2, ILO3, ILO4	The final exam assesses students' ability to understand key theories and concepts of decision analytics and to model and solve real-world decision problems, evaluate cost–risk–flexibility tradeoffs under constraints and uncertainty, and design structured decision-making processes for different application contexts.

Course Outline

	Topic
1	Introduction
2	Project Analytics
3	Facility Location Decisions
4	Inventory Analytics
5	Facility Layout Decisions
6	Supply Chain Analytics
7	Predictive Decision Models
8	Pricing Analytics

Final Grade Descriptors:

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a strong grasp of the concepts, theories, and principles of decision analytics taught in class. Exhibits excellent capability and creativity in modeling, analyzing, and solving decision problems in modern society, often going beyond core requirements to achieve the learning goals.
B	Good Performance	Shows good knowledge of the concepts, theories, and principles of decision analytics taught in class. Exhibits solid capability in formulating and solving decision problems and displays high

		motivation to apply decision analytics in various real-world contexts.
C	Satisfactory Performance	Possesses adequate knowledge of the concepts, theories, and principles of decision analytics taught in class. Makes acceptable progress in applying analytical tools to solve decision problems and shows persistence and effort to achieve the broadly defined learning goals.
D	Marginal Pass	Has threshold knowledge of the concepts, theories, and principles of decision analytics taught in class. Shows basic ability to apply decision analytics tools and make simple judgments, and benefits from the course with potential to further develop in this area.
F	Fail	Demonstrates insufficient understanding of the concepts, theories, and principles of decision analytics. Shows limited ability to think critically or analytically about decision problems and exhibits minimal effort towards achieving the learning goals. Does not meet the threshold requirements for applying decision analytics in professional or further academic contexts.

Course AI Policy

All students are encouraged to use AI wisely in class activities and discussions with proper acknowledgement.

Communication and Feedback

Students who have further questions about the feedback including marks should consult the instructor/TAs within one week after the feedback is received.

Resubmission Policy

To ensure fairness for students who submit assignments on time, a penalty for late submission is listed as follows:

- Late submission within 12 hours, 25% penalty will be applied.
- Late submission between 12 to 24 hours, 50% penalty will be applied.
- Late submission for more than 24 hours will not be accepted.

Reference Books

- Matching Supply with Demand: An Introduction to Operations Management, Gerard Cachon, Christian Terwiesch, McGraw Hill, 2018
- Managing Engineering and Technology: An Introduction to Management for Engineers, Lucy C. Morse, Daniel L. Babcock, Pearson, 2010

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST – Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.