

ISOM 1500 Insightful Decisions, Fall 2026

Department of Information Systems, Business Statistics and Operations Management

COURSE: ISOM1500 Insightful Decisions (3-0-0:3)

This course will create a link between learning of the students and real life problems that can be solved using quantitative methods and decision models. By actively involving students to discover real, interesting applications and to apply logic and reason to process and interpret data for decision making, they will change their attitude toward quantitative models and recognize the flaws and insights of such decisions. The course can be further developed and improved as the student's collection of real life, social issues, and high impact decisions continues to grow through the completion of group projects. The course will be delivered in a blended learning format.

Most students, even with a limited background in math and statistics, should be able to handle them without much difficulty. We intend to cover many decision models and approaches without getting into any advanced and difficult computation. The structure of the course will also allow the students to learn from each other in class discussions and activities; i.e., we will create an opportunity for them to discover the right approaches to decision making through real life problems. Those topics, such as probability, heuristics, and sensitivity analysis, are only introduced as the basic decision-making tools.

INSTRUCTOR: Prof. Suri Gurumurthi (imsuri@ust.hk)

Office: Room 5016B, LSK Building

Office Hours: Tuesdays 12:00–2:00PM, or by appointment

Class meeting times (both sections meet on Tuesdays in Room 4582):

Section L1	Tuesdays 9:00–10:20 AM	Room 4582
Section L2	Tuesdays 10:30–11:50 AM	Room 4582

TEACHING ASSISTANT (both sections):

Athena Chau imachau@ust.hk Meeting by appointment

KEY TERM DATES (HKUST Academic Calendar 2026–27):

Fall Term commences / first class	Tuesday, 1 September 2026
Add/Drop Period	1–14 September 2026
Last class of this course	Tuesday, 24 November 2026
Last day of Fall Term classes	Monday, 30 November 2026
Study Break	1–5 December 2026
Fall Term Examinations	7–19 December 2026

Note: no General Holiday falls on a Tuesday during this term, so all 13 scheduled class meetings will take place. (The Mid-Autumn Festival holiday falls on Saturday 26 September, National Day on Thursday 1 October, and the day following Chung Yeung Festival on Monday 19 October.)

CILO:

(1) Apply critical thinking processes to evaluate and analyse social and business problems, to formulate actionable decisions
(2) Identify and correct common decision fallacies and errors that occur because of faulty assumptions or decision-processes
(3) Apply analytical and quantitative reasoning methods to model and analyse complex social and business problems
(4) Create data-driven, and spreadsheet models to analyze common decisions from everyday life as well as business and socio-economic problems

REFERENCE TEXT:

Online content in the form of Canvas Modules posted on canvas.ust.hk.

GRADING POLICY:

Final course grade will be determined by the following criteria and point distribution:

Class Participation	10
Canvas Reflections (Discussions)	10
Midterm Exam (open slides, open materials)	30
Final Exam (open slides, open materials)	40
Canvas Module Quizzes	10
TOTAL	100

Canvas Module Quizzes: each of the twelve modules has a short quiz of eight multiple-choice questions. You have **two attempts** at each quiz and **10 minutes** per attempt; your higher score counts. Correct answers are released after your last attempt. Complete each quiz after working through that module's pages and before the following week's class.

Note: No makeup will be given for the midterm exam. If you miss the midterm exam for a valid (say medical emergency) reason approved by the instructor, a more comprehensive final exam will be weighted at 70% of the course grade instead. Your participation points are partly determined by in-class exercises/quizzes and other participation each week (total 10 points). **Excellent class discussion and questions raised or answered, will also contribute to the class participation grade.**

COURSE GRADE:

In determining the final course grade, your instructor will consider the following targets.

A	90-100
B	80-90
C	70-80
D	60-70
F	Below 60

ACADEMIC INTEGRITY:

Students at HKUST are expected to observe the Academic Honor Code at all times (see [here](#) for more information). Zero tolerance is shown to those who are caught cheating on the assignments or exam. Any act of cheating in this course will result in a XF grade for the course. This XF grade will stay with your record until graduation. If you receive another XF or X grade, you will be dismissed from the University.

BLENDED LEARNING:

This course will follow a blended learning format. Blended learning involves the use of classroom lectures, technology in the form of online Canvas tools, and out of class self-study to deliver effective and comprehensive learning. Practically what this means is that we will meet for an 80 minute lecture once per week per section. The time we have saved for the other lecture, will be used by students to absorb content delivered online via Canvas tools and to perform preparatory exercises in anticipation of the week's lecture. We will also use Canvas to complete assignments and to provide feedback on assignments. Blended learning, in my experience only works when we understand that there is greater emphasis on self-study and preparation prior to the lecture (and sometimes after the lecture also). **Recognizing this crucial point will lead to better performance throughout and at the end of the course.**

COURSE MAP:



1500 CourseMap

COURSE OUTLINE & WEEKLY READINGS

All classes meet on Tuesday in Room 4582 — Section L1 at 9:00–10:20 AM, Section L2 at 10:30–11:50 AM. Read the Canvas module pages before the class listed.

Week 1 Tue 1 Sep Conventional Lecture CLO 1,3	Module 1 — How We Make Decisions, and Why Some Are Hard In-Class Activities: 1. What counts as a decision: irrevocable allocation of scarce resources 2. Visual perception exercises — the Müller-Lyer lines, Shepard's tables, ambiguous figures 3. Discussion of everyday decisions versus significant decisions requiring analytical effort 4. Big business decisions that worked, and that did not
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Week 2 Tue 8 Sep ½ Conventional Lecture + ½ Flipped Classroom CILO 1,3	Module 2 — Basic Elements of System 2 Decision-Making In-Class Activities: 1. “Thinking fast and slow” examples; differences between System 1 and System 2 2. Alternatives, outcomes, risk and process; the ProACT framework 3. Can good decision-making lead to negative outcomes? The decision–outcome matrix 4. Building a payoff table and computing expected value <i>Last day of Add/Drop Period: Monday 14 September</i>
Week 3 Tue 15 Sep ½ Conventional Lecture + ½ Flipped Classroom CILO 1,2	Module 3 — Decision Errors and Human Limitations In-Class Activities: 1. The six decision traps: anchoring, status quo, sunk cost, confirming evidence, framing, estimating 2. Overconfidence exercise — 90% confidence intervals on ten unfamiliar quantities 3. Correlation versus causation; Simpson’s paradox worked through 4. Online survey to be completed in class
Week 4 Tue 22 Sep ½ Conventional Lecture + ½ Flipped Classroom CILO 1,2	Module 4 — What Are Different Problem Types? In-Class Activities: 1. Define and identify Drucker’s four problem classes; classification exercise 2. Common decision fallacies: reinventing the wheel, ego-centrism, avoidance, quick wins 3. Goals and objectives; trade-offs and utility 4. Compensatory versus non-compensatory decision rules — same data, opposite answers
Week 5 Tue 29 Sep ½ Conventional Lecture + ½ Flipped Classroom CILO 2,3	Module 5 — Critical Thinking in System 1 and System 2 In-Class Activities: 1. Validity and soundness; spotting logical fallacies in worked examples 2. Inductive versus deductive reasoning exercise 3. Cash in the Hat game — moral hazard and credible commitment 4. Critical thinking in interactive (team) decision-making
Week 6 Tue 6 Oct ½ Conventional Lecture + ½ Flipped Classroom CILO 2,3	Module 6 — Analytical Skills for System 2 Decision-Making In-Class Activities: 1. Quantitative, heuristic and simulation techniques; when each applies 2. Prisoner’s Dilemma card game — single, high-stakes and repeated rounds 3. Pirate Game — backward induction and multi-stage group decisions 4. Everyday game theory: pricing, the commons, advertising

Week 7 Tue 13 Oct ½ Conventional Lecture + ½ Flipped Classroom CILO 3,4	Module 7 — System 2 Decision-Making: Optimisation In-Class Activities: 1. Thought experiments involving optimisation; the critical path of a project 2. Product mix worked by hand — profit per unit of the scarce resource 3. Introduction to Excel Solver, and reading the sensitivity report 4. Shadow prices: what one more unit of a binding resource is worth
Week 8 Tue 20 Oct MIDTERM EXAM	Midterm Exam — covering Modules 1 to 7 Open slides, open materials. The exact time and venue for the exam will be published on Canvas, along with a study guide, a few weeks beforehand. Venue: TBD
Week 9 Tue 27 Oct ½ Conventional Lecture + ½ Flipped Classroom CILO 3,4	Module 8 — Decision Making Under Uncertainty In-Class Activities: 1. Discussion of games of chance; the Monty Hall problem 2. How uncertainty can be a perception rather than a reality; uncertainty versus risk 3. One-time decisions under uncertainty — the Newsvendor model and marginal analysis 4. The flaw of averages, risk tolerance, and hedging and insurance decisions
Week 10 Tue 3 Nov ½ Conventional Lecture + ½ Flipped Classroom CILO 3,4	Module 9 — Analytical Methods: Simulation Modelling In-Class Activities: 1. Discussion of random walks and Buffon’s needle 2. Spreadsheet simulation model building — the Newsvendor revisited 3. Reading the results: expected value, spread, probability of loss 4. Portfolio simulation and correlated returns
Week 11 Tue 10 Nov ½ Conventional Lecture + ½ Flipped Classroom CILO 3,4	Module 10 — Analytical Methods: Decision Trees In-Class Activities: 1. Payoff tables and decision criteria; rolling back a decision tree 2. Envelope Game — the expected value of information 3. Breakeven analysis: a bakery in Tsim Sha Tsui or Hang Hau? 4. Multi-stage decision-making with recourse; real options and discounting
Week 12 Tue 17 Nov ½ Conventional Lecture + ½ Flipped Classroom CILO 1,4	Module 11 — Big Data: Concepts and Challenges In-Class Activities: 1. Identify uses of big data; the three Vs, and the fourth 2. How can we make better decisions with big data — and when does more data not help? 3. Data quality, bias and privacy; the wisdom of crowds 4. Time series forecasting; examples of AR and VR in decision-making

Week 13 Tue 24 Nov ½ Conventional Lecture + ½ Flipped Classroom CILO 1,2,4	Module 12 — Artificial Intelligence: Potential and Pitfalls In-Class Activities: 1. What AI is, and the four functional types 2. How machines learn, and six ways they fail 3. Will AI replace human decision-making? Automate, augment or advise? 4. Course review and preparation for the final examination <i>Last day of Fall Term classes: Monday 30 November. Study Break 1–5 December. Fall Term Examinations 7–19 December.</i>
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