The Hong Kong University of Science and Technology

Optimization for Decision Making (IEDA 1250)

Summer, 2025

Monday, Tuesday, Friday 09:30 am – 12:30 pm

Instructor: Bo YANG (Email: yangb@ust.hk; Office: 5584)

Office hour: By appointment

Teaching assistant: TBD

Tutorial: TBD

Course Description

Optimization plays a central role in enhancing decision making - be it in traditional engineering and business settings or in today's more competitive and dynamic world powered by advanced machine learning techniques. Effective decision making requires sophisticated modeling and solution skills to improve performance metrics such as profit, accuracy, speed, etc. This course provides students with a glimpse of fundamental optimization techniques and their applications in areas such as inventory control, vehicle routing, financial trading, and machine learning, while preparing students for more advanced coursework in the future.

Recommended Textbooks

The textbooks are optional but recommended for students with particular interests in Industrial Engineering and Operations Research. They provide broad overviews of the field and materials for solution approaches and various applications.

- *Introduction to Operations Research*, by Hillier, Frederick S., and Gerald J. Lieberman, McGraw-Hill, 2015.
- *Operations and Supply Chain Management*, by F. R. Jacobs and R. Chase (13th edition), McGraw-Hill, 2018
- *Convex Optimization*, by Boyd, Stephen, 2004

Prerequisites

Calculus and Probability at an introductory level will be very helpful, but not required.

Course Web Page

A web page will be available for this course on Canvas. You will need to access this web page for announcements about class, lecture notes, homework assignments and their

solutions, and other materials. All the slides used in class will be posted on the web page before each lecture.

Grading

Your final grade will be determined using the following weights:

1. Two Individual Assignments 20%
2. Midterm Exam 40%
3. Final Exam 40%
4. Class Participation 0%, helpful to the boarder case

Assignments

There will be two homework assignments. Students need to work individually on the homework assignments. You should upload a soft copy via Canvas by the date when the assignment is due. Late submissions will **NOT** be accepted.

Exams

The midterm and final exams will take place during class. They are 80 minute exam. The time and location for the exams will be determined later.

Class Participation

Please come to the class fully prepared. This will maximize your gain from the class. Regular attendance and participation in all classes will be helpful for the boundary case.

Policies

As a member of the HKUST community, you are expected to meet the highest standards of academic behavior. Please review the university statement on academic integrity. On homework assignments, high-level collaboration, like discussion on methods to solve homework problems, is permitted. However, sharing solutions or numerical answers is not allowed and is considered cheating. Sharing solutions or cheating on exams will result in a zero grade on that assignment or exam, and related university policies will be strictly enforced.