

MAEG 4070: Engineering Optimization

Course Outline, 2022-2023 Term 1

Instructor	Prof. CHEN Yue yuechen@mae.cuhk.edu.hk
TAs	DENG Zhiyu zydeng@mae.cuhk.edu.hk INNERO Gino ginnero@mae.cuhk.edu.hk JIN Liuchao lcjin@mae.cuhk.edu.hk LIU Jingjun jingjunliu@mae.cuhk.edu.hk TANG Yunxi yxtang@mae.cuhk.edu.hk
Class Time	Monday 16:30-18:15 (LPN LT) Wednesday 11:30-12:15 (LHC 104) Tutorial: TBD (by TAs starting from week 2)
Office Hours	Friday 13:00-14:00 (online), or by appointment Zoom link: https://cuhk.zoom.us/j/95450969213?pwd=ZlZkWC9wMjJhOG5Da1RkMS82d0V6QT09 Passcode: 021836 Prof. CHEN (FYB 604C) (TA) DENG Zhiyu (ERB113) (TA) INNERO Gino (AB1 205) (TA) JIN Liuchao (ERB 201) (TA) LIU Jingjun (AB1 2F) (TA) TANG Yunxi (AB1 2F)

The course will introduce basic concepts of engineering optimization methods as applied to engineering problems. Fundamental optimization theory and methods will be presented, including:

- linear programming
- unconstrained optimization
- constrained optimization
- convex optimization
- dual theory
- linearization techniques

Advanced topics, such as distributed optimization, multi-objective optimization, and solving optimization using MATLAB, will be introduced to equip students with broadened skills for future research endeavors and career paths. Engineering examples will be given. The tools learned from the Engineering Optimization have broad application fields such as artificial intelligence, finance, data science, systems engineering and management, etc.

Course Materials

- **Check Blackboard regularly for updated slides and notes.**

- Reference:

S. Boyd, L. Vandenberghe. *Convex optimization*. Cambridge university press, 2004.

R. Sioshansi, A. J. Conejo. *Optimization in Engineering: Models and Algorithms*. Springer, 2017.

S. S. Rao. *Engineering optimization: theory and practice*. John Wiley & Sons, 2019.

Grading

- Homework Assignments: 25%

- Mid-term exam: 25%

- Final Exam: 50%