Optimization for Systems and Control

Bart De Schutter

2024–2025

General information on the course

- Web site: `https://www.dcsc.tudelft.nl/~bdeschutter/osc/`
  or via Brightspace (course code: sc42056)
  - extra information (*errata*, schedule, ...)
  - Matlab files
  - additional reading
  - sample exams and exercises

- Lecture notes:
  "Optimization for Systems and Control"
  by Ton van den Boom and Bart De Schutter
  Edition September 2024

  (access directly at
  `https://www.webedu.nl/bestellen/tudelft/`)
  Use course code SC42056 to find or order these lecture notes.

- If needed, you can download and install Matlab on your own
  computer via `https://software.tudelft.nl`

Schedule

Lectures: Tuesday and Thursdays, 8.45-10.30 (mostly room B, ME building)

Sep 24: Introduction + Chapter 1

Sep 26: Chapter 1–2

Oct 1: Chapter 2–3 + toolbox (LP, QP)

Oct 3: Chapter 4

Oct 8: Chapter 5-6

Oct 10: Chapter 6

Oct 15: Chapter 7, 9

Oct 17: Chapter 8, 10 (room D)

Oct 22: Chapter 11

Oct 24: Question hour/backup (room C)

Assessment

- Important: partial marks for exam or assignment do not carry over from one academic year to the next

- Written exam (**70 %** of the final grade):
  - ▸ date: Tuesday, November 5, 2024 (9.00–12.00)
  - ▸ format:
    - ★ written exam
    - ★ closed book
    - ★ no calculators allowed!
  - ▸ topics: lecture notes (Chapters 1–11)
  - ▸ registration via Osiris required
  - ▸ resit: Friday, January 24, 2025, 13.30–16.30

- Assignments (**30 %** of the final grade)

- Bonus points (max. 1): by reporting new errors in lecture notes

Assessment for SC42056

- Written exam (**70 %** of the final grade)

- Assignments (**30 %** of the final grade):
  - ▶ 2 assignments:
    - ★ linear and quadratic programming (40 %)
      online: Oct. 1, 2024, deadline: Oct. 14, 2024 at 17.00
    - ★ nonlinear programming (60 %)
      online: Oct. 10, 2024, deadline: Oct. 28, 2024 at 17.00
  - ▶ descriptions will be posted on Brightspace
  - ▶ use matlab to solve various optimization problems
  - ▶ in groups of 2 persons
  - ▶ clearly motivate any choices in the report
  - ▶ be original! (note: similarity check will be performed)
  - ▶ hand in via Brightspace
  - ▶ Questions on assignments: preferably via Brightspace forum, and if really needed during office hours (see Brightspace for schedule)

  - ▶ take care: -0.5 for each started day of delay

- Bonus points (max. 1): by reporting new errors in lecture notes

Additional comments

- Important to note that the assignment and the exam serve different learning objectives

- Course website provides exercises with solutions for students that want to have additional, easier homework-like assignments
  To keep load limited, this is optional and not to imposed as a homework

Contact information

- Please enroll via Brightspace if you want to stay informed

- Use lectures or Brightspace forum for questions on lectures

- Preferably use Brightspace forum for questions on assignments

Extra information regarding discrete-time systems

- For students that did not encounter discrete-time systems (state space models, stability, . . .) in earlier courses: introductory lecture notes on discrete-time systems can be downloaded via Brightspace