MA3252 Linear and Network Optimization

Course Syllabus: Spring 2026

Lecture	Lecture Theatre (LT) 26, 7:00 PM – 10:00 PM every Friday
Instructor	Shaoning Han Email: shaoninghan@nus.edu.sg
Reference Books	• Dimitris Bertsimas and John N. Tsitsiklis, *Introduction to Linear Optimization*, Athena Scientific (1997).

Course Description: MA3252 is a 4-unit course designed for undergraduate students in mathematics. The objective of this course is to work on optimization problems whichcan be formulated as linear and network optimization problems. It covers a variety of topics: LP modeling; Geometry of LP; Development of simplex method; Duality theory; Sensitivity analysis; Network optimization problems and the network simplex method. Lectures are based on course notes which will be posted on Canvas. There is **no** required textbook. Lectuers will be recorded and uploaded to Canvas>Videos/Panopto.

Prerequisite: The only prerequisite is linear algebra. If undertaking an Undergraduate Degree THEN (must have completed 1 of MA1311/MA1508E/MA1513/MA1522/MA2001 at a grade of at least D)

Homework Assignments:

- There will be **four** homework assignments.
- All homework assignments are **due by 11:59am** on the date indicated. Late homework submissions are **not** accepted **under any circumstances**.

Exam:

- The midterm test is open book, but no electronic device is allowed.
- The final exam is closed-book. Students can take one double-sided A4 size helpsheet prepared by their own. No other exam tools are allowed.

Grade Distribution:

- Homework assignments (30%)
- Midterm (30%)
- Final exam (40%)

Tentative Course Plan:

- Introduction to linear programming (1 lecture)
- Geometry of linear programming (2 lectures)
- The simplex method (2 lectures)
- Duality theory (2 lectures)
- Sensitivity analysis (1 lecture)
- Network optimization (1 lecture)
- The network simplex method (1 lecture)

Email Policy Do not expect immediate responses to emailed questions. I will try to respond to all emailed questions within 48 hours. Try to keep your email short and direct. It is advised that you include "MA3253" as part of your email title/subject. For questions regarding homework, please contact the grader first.

University policies

• *Statement on Academic Integrity*. The University is committed to nurturing an environment conducive for the exchange of ideas, advancement of knowledge and intellectual development. Academic honesty and integrity are essential conditions for the pursuit and acquisition of knowledge, and the University expects each student to maintain and uphold the highest standards of integrity and academic honesty at all times. The University takes a strict view of cheating in any form, deceptive fabrication, plagiarism and violation of intellectual property and copyright laws. Any student who is found to have engaged in such misconduct will be subject to disciplinary action by the University. Students are referred to `https://www.comp.nus.edu.sg/cug/plagiarism` and `https://www.usp.nus.edu.sg/curriculum/plagiarism` for more detailed standards and policies on plagiarism & academic dishonesty.

• *Statement for Students with Disabilities*. NUS strives to provide an inclusive and nurturing campus environment for students with disabilities or accessibility needs to achieve their fullest potential. The Student Accessibility Unit (SAU) serves as a key touchpoint dedicated to supporting the range of access needs that students may have. The unit works closely with NUS offices and external partners to facilitate and provide individualised support services and resources to meet students' diverse needs. More guidance and information can be found at `https://nus.edu.sg/osa/orientation/resources/accessibility-support` and `https://osa.nus.edu.sg/services-support/accessibility-support/`. Contact email of SAU: accessibility@nus.edu.sg.