Mathematics for Decision Making I (MA437)

Angela Carnevale & Joshua Maglione

Semester 1 (2024)

Module information:

Coordinates:

Wednesdays	3:00pm – 3:50pm	AC201
Thursdays	1:00pm – 1:50pm	AMB-G005

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Topics: We will cover three fundamental topics of optimization:

1. the simplex algorithm,
2. polyhedral geometry,
3. the notion of duality.

Time permitting we will cover some topics in integer programming.

Assessment: There is no timed final exam for this module. The overall assessment comprises three components:

- an in-class test during either week 6 or 7,
- a group project, including a short presentation in week 12,
- a "take-home" exam, due approximately at the end of the exam period.

Each of the three components is worth the same, so each part is one third of the final mark. The details of these components are not yet set and will be announced once they are known.

Reading list: We will follow [2] closely, but you might want other perspectives as well. Here is a more comprehensive list (some are available through the library and others can be found online):

[1] Stephen Boyd and Lieven Vandenberghe. *Convex optimization*. Cambridge University Press, Cambridge, 2004.

[2] Bernard Kolman and Robert E. Beck. *Elementary linear programming with applications*. Computer Science and Scientific Computing. Academic Press, Inc., San Diego, CA, second edition, 1995. With 1 IBM-PC floppy disk (3.5 inch; HD).

[3] Alexander Schrijver. *Theory of linear and integer programming*. Wiley-Interscience Series in Discrete Mathematics. John Wiley & Sons, Ltd., Chichester, 1986. A Wiley-Interscience Publication.