Optimization Algorithms (ACM 41030) – Introduction

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1 Overview

In this brief document, I explain the format of ACM 41030 in the Spring Trimester of the Academic Year 2025-2026, starting in Week 1, Monday January 19th 2026.

Version history:

- First version, 5th January 2026

2 Mode of Delivery

The instruction in this module is planned to be primarily face-to-face.

Faculty responsible for the delivery of the module

The module will be taught by Dr Lennon Ó Náraigh. The first seven weeks are shared with another cohort, ACM 40990. During these weeks, we will all together look at the theory of unconstrained optimization – both local and global. After the midterm break, the class splits in two: Professor X will take the ACM 40990 students, while Dr Lennon Ó Náraigh will continue to take the ACM 41030 students. During these remaining five weeks, students in ACM 41030 will look at the theory of constrained optimization.

Format of module

The format throughout the module will be as follows:

- Three face-to-face lectures per week:
    - Tuesdays at 09:00 (possibly to be replaced with a recorded lecture, subject to student demand)
    - Thursdays at 15:00 (two hours).

VLE

My website will be the main point-of-reference for this module:

$$\texttt{https://maths.ucd.ie/} \sim \texttt{onaraigh/optimization.html}$$

Already, there is a complete set of **typed notes** available there. The lectures will follow the typed notes closely. Brightspace won't be used that much in this module.

3   Assessment

The assessment structure is as follows:

- One hour-long written exam, which will assess the materials from the first seven weeks of the module. The exam will take place during the trimester, probably just after the midterm break. This will be worth **50%** of the final grade.
- A second hour-long written exam will assess the materials from the remaining five weeks of the module. The exam will take place at the end of the teaching period of the trimester, that is, during the exam period. This will also be worth **50%**.

4   How to succeed in this module

The Lecturer will give out seven sets of exercises: four before the midterm break, and three afterwards. These are not for credit. Model answers will be provided. We will work though some of the model answers in class. These exercises are a bit like training, if you can do all of the exercises you will really understand the module. With that in mind, some of the questions in the two written exams will be drawn from the exercises. To be more precise, the written exams will be based on the following topics:

- A selection of questions drawn from Exercises 1–4 (Exam 1) and Exercises 5–7 (Exam 2).
- A selection of theorems from the lecture notes (the list will be provided in due course).

Integrity in assessment

The usual rules around academic integrity to all elements of assessment in the module. There is a university plagiarism policy which is posted on the Brightspace page, along with the School of Mathematics and Statistics academic integrity protocol.

Please don't fail the module!

If you do, there will be a resit exam in the Summer Trimester.

5   Grading

The Standard Conversion Scale is used in this module

6 Textbooks

The typed lecture notes are self-contained. For extra reading, students may refer to the following recommended textbook:

Nocedal, J. and Wright, S.J. eds., 1999. *Numerical Optimization*. New York, NY: Springer New York.