Optimization (ACM 40990 and ACM 41030)

Written Exam

Final version, dated 05/03/2026

ACM 40990 and ACM 41030 share the first written exam:

- Worth 40% of the module grade (ACM 40990)
- Worth 50% of the module grade (ACM 41030)

This will take place after the midterm break, on **Tuesday 24th March** from 7pm to 8pm, in the Blackrock Exam Centre. The exam will last exactly one hour. **Please familiarize yourself with the location of the exam centre beforehand.**

The exam will contain four questions; all four questions must be answered. The exam format is **closed book**. Non-programmable calculators are permitted.

The following is the final list of examinable topics:

- Theorems in Section 1.3 (Convex Sets / Convex Functions)
- Theorem 2.8 (Convex functions and their minimizer)
- Model Problem, Section 2.3
- BFGS formulae, pages 29-31, including Theorem 4.2, but NOT Sherman-Morrison-Woodbury
- Theorem 6.2
- Exercises #1, including pseudocodes. Note: it will not be required to produce a pseudocode to implement the SWCs. But a pseudocode to implement backtracking line-search might be asked.
- Exercises #2.
- Cauchy-point calculation, Section 7.6
- Exercises #3, *but only Question 1*. The Sherman-Morrison-Woodbury formula would be given – you don't have to memorize this.
- The convergence proof of the SA algorithm, Section 18.4
- Exercises #4, including pseudocode for the MH and SA algorithms.