

Detailed instructions for the oral exam in MAT4701

The exam will consist of 3 different parts:

Part 1: A short lecture

The candidate should prepare 5 short talks on each of the topics:

- a) The Itô formula and martingale representations
- b) Stochastic differential equations
- c) Some results related to Itô diffusions
- d) Optimal stopping
- e) Control theory

Each talk should have a duration of 10-15 minutes. The talks should present some *selected* results under the 5 headlines, and there is considerable freedom of choice. It is *not* the intention to present *all* the theory we have studied in class.

15 minutes before the exam, one of these talks are drawn randomly and the result is announced to the candidate. The candidate then have 15 minutes to study his/hers notes on the topic. No aids/notes are permitted once the exam have started.

Part 2: Proof of one of the central results

The candidate should be prepared to sketch a proof of one of the central results in the theory. The required task is announced during exams once part 1 is finished, and no aids are permitted.

Part 3: Problem solving

The candidate will be presented with a mathematical problem and should be able to work out the solution.

The problem will be new, i.e., *not* a problem we have solved during the course. The solution will require the same techniques we have used during exercises. To prepare for this, the candidate should solve all the given exercises/assignments.

No aids are permitted during this part. If the candidate is stuck he/she can ask for hints on how to proceed.