MAT4750 - Mathematical Finance: modelling and risk management
Guidelines to the exam

The final evaluation for the course is an oral exam held at the blackboard on the topics of the course.
The candidate is asked a number of questions for about 40 minutes. The starting major questions will be drawn from the list here below. It is also expected that the candidate can reply subquestions stemming out from his own presentation and related to the background material.

Topics:

1. Levy processes and characteristic functions of infinitely divisible disributions. Levy-Khintchine formula. Examples.
2. Levy processes and mixtures of Gaussian-Poisson random fields. Martingale random fields. The Levy-Ito representation. Ito formula for processes with jumps.
3. Stochastic exponential and the Girsanov theorem
4. Market model and related assumptions/concepts/quantities.
5. Non-arbitrage pricing principle, the non-arbitrage price of a replicable claim and the non-arbitrage price interval for all claims. Corresponding pricing formulae.
6. Integral representation and the non-anticipating derivative. Their use in hedging replicable claims. Computation of the hedging strategy in a Brownian driven market.
7. Integral representation and the non-anticipating derivative. Their use in hedging replicable claims. Quadratic hedging in incomplete markets.
8. Girsanov theorem for Brownian motion and in the case of jumps. Its application to the finding of risk neutral measures.