This course will demonstrate how recent advances in optimization modelling, algorithm and software can be applied to solve practical problems in computational finance. Previous exposure to optimization theory and methods is not assumed.

LEARNING OUTCOMES – SUBJECT MASTERY

Ability to formulate and solve practical problems arising in finance using modern optimization methods and software. Familiarity with different formulations, their purpose, strengths and weaknesses.

SYLLABUS

- Linear Programming: Computing a dedicated bond portfolio, Asset pricing and arbitrage.
- Quadratic Programming: Portfolio optimization (Markowitz model).
- Conic Optimization: Approximating covariance matrices.
- Integer Programming: Constructing an index fund.
- Stochastic Programming: Asset/Liability management. The role of simulation in modelling and solving stochastic programming problems.
- Robust Optimization: Robust portfolio selection.

LOCATION AND ASSESSMENT METHODS

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Re-assessment in the next academic year.