0062 (Mathematics and Statistics of Algorithmic Trading)

October 8, 2019

Year: 2019–2020
Code: MATH0062
Value: 15 UCL credits (= 7.5 ECTS)
Term: 2
Structure: 3 hour lectures per week
Assessment: 100% examination. Student must achieve at least 50% to pass this course.

Normal Pre-requisites: MATH0088 Quantitative & Computational Finance
Lecturer: Dr H Ni

Course Description and Objectives

The objective of this course is to introduce mathematical concepts and tools used in the finance industry for algorithmic and high-frequency trading.

Some of the techniques taught in this course are standard in the finance industry and other material is cutting edge research that is currently being applied by proprietary trading desks. In addition, the course includes the stock price prediction using machine learning methods. The student will be familiar with industry-standard methods and will be able to set-up and solve stochastic control problems that deal with the most up-to-date requirements of the industry; market making, optimal liquidation, optimal execution, VWAP schedules, statistical arbitrage and pairs trading.

On successful completion of the course, a student should have a good understanding of how electronic markets function and what are the problems faced by stakeholders when buying and selling assets. Students will have a
good understanding of market making activities - designated traders, specialists, and high-frequency traders. Moreover, the student will be familiar with some of the classical microstructure theory of market making and will be able to work with ultra-high frequency data (millisecond stamped).

Recommended Texts