

Algorithmic and High Frequency Trading
Professor Alfonso Dufour
COMPLETE MODULE DESCRIPTION

Module Provider	ICMA Centre; Henley Business School
Level	7 (Master level)
When you will be taught	Summer term module
Academic year	2024/25
Module Convenor	Dr Alfonso Dufour
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Module aims and purpose	<p>Industry participants estimate that 70-80% of equity trades are executed through computers. Market-makers in equity, fixed income and currency markets use algorithms to automatically adjust their quotes. This module reviews the current state of the trading industry and identifies aims, features, regulations, and limitations of three main groups of algorithmic trading strategies: market making, trade execution and statistical arbitrage. Practical seminars are used to demonstrate how to apply trading algorithms to high-frequency data. This module will equip the students with a basic knowledge of algorithmic and high frequency trading strategies which are commonly used in the trading industry.</p>
Module learning outcomes	<p>By the end of the module, it is expected that students will be able to:</p> <ul style="list-style-type: none"> • Explain the concepts of high frequency trading and algorithmic trading. • Identify the characteristic elements of alternative algorithmic trading strategies. • Solve simple trade execution problems and develop effective execution strategies. • Develop tick-by-tick data management skills, apply Excel functions such as Pivot Tables and Solver and basic programming knowledge to solve simple high-frequency trade data problems.
Module content	<p>Topic 1. Overview of algorithmic trading: definitions, industry trends and trading strategies.</p> <p>Topic 2. Insights for working with high-frequency data – features, seasonality, relevant variables, trends and common patterns.</p> <p>Topic 3. High Frequency Trading (HFT): definitions and regulation. Presentation of main HFT players and their strategies.</p> <p>Topic 4. Market making strategy. Insights for developing auto quoting systems.</p> <p>Topic 5. Overview of popular trade execution algorithms: VWAP, TWAP, Volume in line (participation), Liquidity seekers (Tex, Guerrilla, etc.) and Optimal trade execution.</p> <p>Topic 6. Optimal execution risk and impact cost of large size orders</p> <p>Topic 7. Developing and implementing the VWAP execution strategy: naïve VWAP vs. smart VWAP. Reviewing ITG VWAP strategy.</p> <p>Topic 8. Introduction to technical analysis. Developing a trading strategy with automatic trading decisions.</p> <p>Topic 9. Executing and assessing the performance of a statistical arbitrage trade.</p>