# UCL MSc Finance with Data Science 2025-26 indicative taught module descriptions

In Term 1, all students take MSIN0269 Financial Econometrics and Data Science (30 credits) and MSIN0271 Corporate Finance and Financial Markets (30 credits).

In Term 3, all students take the research module MSIN0278 Finance with Data Science Research Project (30 credits). This module is assessed in Term 3.

### **Compulsory Taught Modules**

TERM 1

MSIN0269 Financial Econometrics and Data Science MSIN0271 Corporate Finance and Financial Markets

TERM 2

MSIN0106 Time Series Analysis and Forecasting MSIN0208 Big Data Analytics

TERM 3 MSIN0278 Finance with Data Science Research Project

## **Optional Taught Modules**

TERM 2

You must take ONE module and can take a maximum of THREE modules from this group: MSIN0272 Options and Derivatives MSIN0273 The Economics of Trading and Exchanges MSIN0275 Advanced Corporate Finance

TERM 3

You must take ONE module and can take a maximum of THREE modules from this group: MSIN0274 Investment Strategies and Risk Management MSIN0276 International Finance MSIN0277 Behavioural Finance and Neuroeconomics

Note: for workload balance, students might consider taking two optional modules in Term 2 and two optional modules in Term 3. However, the combination of your academic interests may mean you wish to take three optional modules in Term 2 and one in Term 3, for example.

The following descriptions should be regarded as an indicative guide – they are subject to change.

## **Compulsory Research Project Module**

#### MSIN0278 Finance with Data Science Research Project (year-long, compulsory)

The research project allows you to build and combine what you have learned across the taught modules. You will endeavour a project related to a question or problem in finance and will perform an analysis that will lead to data-driven conclusions or solutions. There are 3 possible tracks: i) time series and forecasting; ii) big data and machine learning; iii) custom. If you elect for one of the first two, you will have the choice between types of well-defined projects, for which you will have to collect data, perform the analysis, and present your conclusion in a report. If you choose the custom track, you will be able to define the research question or problem (which could be theoretical or a problem facing a real-world company).

## **Compulsory Taught Modules**

#### MSIN0269 Financial Econometrics and Data Science (Term 1, compulsory)

This module covers four, intertwined dimensions of quantitative finance: i) an introduction to tools and concepts of quantitative finance (such as time value of money, risk, returns, and diversification) with concrete applications (such as the valuation of investment opportunities, or portfolio management); ii) the standard tools of financial econometrics (such as probability theory, estimation, hypothesis testing, and regression analysis); iii) the use of software and programming language (such as Python) to collect and manipulate financial data; iv) an introduction to popular databases in the world of finance.

#### MSIN0271 Corporate Finance and Financial Markets (Term 1, compulsory)

This module covers the economics foundations of asset pricing (risk-aversion, diversification, equilibrium in capital markets) and of corporate finance, that is of firms' financing and investment decisions. It introduces you to the economics of financial markets (e.g. fixed income, stock, and currency markets) and also to financial institutions. You will explore and assess economic models with real-world financial data.

#### MSIN0106 Time Series Analysis and Forecasting (Term 2, compulsory)

This module builds on Financial Econometrics and Data Science, and aims to deliver an overview of the state-of-the-art econometric methods used by researchers and practitioners in the empirical analysis of financial data. The main focus of the course is on time series methods, i.e., the analysis of data measured over time and at different frequencies, with the goal of building models explaining the dynamic evolution of economic and financial data over time. Important applications will focus on risk management and on forecasting.

#### MSIN0208 Big Data Analytics (Term 2, compulsory)

This module discusses modern methods from Computer Science and Statistics for the analysis of large datasets. Those "Machine Learning" or "Statistical Learning" methods have become essential tools for the exploration and evaluation of data in the world of Finance. Various approaches for data inspection, inference and prediction will be discussed both from a theoretical and applied perspective. Topics typically covered include cluster analysis, dimensional reduction methods (like LASSO and principal components), artificial neural networks, and other related topics.

# **Optional Taught Modules – Term 2**

#### MSIN0272 Options and Derivatives (Term 2, optional)

In this module you will learn about financial derivates and options, from the theoretical foundations to real-world data analysis. Theoretical tools, concepts and models such as risk-neutral pricing, the binomial model and the Black-Scholes model will be discussed and applied to a wide range of derivative and options, such as futures, forwards, swaps, American and European options, and real options.

#### MSIN0275 Advanced Corporate Finance (Term 2, optional)

This module is dedicated to advanced issues in corporate finance. You will learn to navigate the world of investment banks, venture capitalists, and alike and relate salient issues to real-world data. Specific topics covered may vary depending on industry trends, but typical topics include advanced valuation techniques, bond issuance, stock initial public offerings, seasoned offerings, entrepreneurial finance, private equity and venture capital, mergers and acquisitions, leverage buy outs, firm risk hedging, and loan syndication.

#### MSIN0273 Economics of Trading and Exchanges (Term 2, optional)

In this module you will learn the economics of trading and exchanges from theoretical foundations to real-world data analysis. In particular, you will explore i) the role of information and incentives in determining market outcomes given existing trading protocols; and ii) the design of protocols and exchanges for shaping market outcomes; and you will use the underlying models and concepts to analyse real-world financial data, for instance to assess exchange efficiency.

# **Optional Taught Modules – Term 3**

#### MSIN0274 Investment Strategies and Risk Management (Term 3, optional)

This module describes and analyses investment strategies and risk management in the operation of investment banks, hedge funds, commercial banks, and other financial institutions. The main aim is to study the links (or lack thereof) between these practices and the foundations of finance. Topics include factor models in practice, hedging, arbitrage, passive and active portfolio management, use of machine learning and artificial intelligence.

#### MSIN0276 International Finance (Term 3, optional)

This module covers the topics in international macroeconomics that are essential to professionals taking up jobs related to international financial markets: international trade and models of exchange rate; how central banks and governments influence global financial markets with monetary and fiscal policy, the theory of money and banking and applications to cryptocurrencies and crypto platforms.

Additional topics and applications will respond to current affairs and developments in global financial market.

#### MSIN0277 Behavioural Finance and Neuroeconomics (Term 3, optional)

This module introduces you to the main findings of behavioural finance, experimental finance and neuroeconomics. The overarching theme is how investors and other financial markets participants make their decisions. The module is based on discoveries from finance, economics, neuroscience, psychology, etc. Applications include biases in choice under risk, the role of ambiguity aversion, excess volatility, equity premium puzzle. The module covers both theoretical results and data from laboratory and field experiments.