



BAYES
BUSINESS SCHOOL
CITY ST GEORGE'S
UNIVERSITY OF LONDON

World Federation of Exchanges Market Infrastructure Certificate (MIC) at Bayes Business School

Information for prospective applicants

wfe WORLD FEDERATION
OF EXCHANGES

[Always learning]

bayes.city.ac.uk

Contents

Programme context and objectives: Market Infrastructure Certificate (MIC)	3
The World Federation of Exchanges	4
Programme structure	5
Learner's Journey	6
Academic certification	7
Applicant eligibility	7
University partner	8
Learning outcomes of the programme	9
Detailed description of modules:	
Module 1. Payments and financial market infrastructures	10
Module 2. Exchanges, Asset classes and Market Micro-structure	11
Module 3. Regulation, Ethics and Sustainable Finance	12
Module 4. Industry Project on market infrastructures	13
Chicago Board Options Exchange (CBOE) residential week	14

Programme context and objectives

Market Infrastructure Certificate (MIC)

The Market Infrastructure Certificate (MIC) is an advanced bespoke programme, the only one of its kind, focused on the fundamental aspects and activities of regulated Market Infrastructures (MIs) such as exchanges, clearing and settlement organisations, central counterparties, and central securities depositories that are key parts of contemporary financial markets.

It is purpose-built to serve the learning needs of professionals at central banks, buy-side and sell-side firms, exchanges, clearing houses and regulatory bodies who need to engage with, and understand, the functioning and role of market infrastructures.

The programme provides integrative, systemic knowledge enabling you to connect the dots across market infrastructures' specialist topics and

obtain crucial insights into state-of-the-art methodologies adopted across market infrastructures.

The programme consists of 15 weeks of part-time study and follows a blended learning approach, consisting of a 13-week online phase and two one week in-person residential.

The online component and first residential week will enable you to acquire rigorous, in-depth knowledge in the modules constituting the four main pillars of the programme:

1. Payments and market infrastructures (CCPs, CSDs, SSSs)
2. Exchanges, Asset classes and Market Micro-structure
3. Regulation, Ethics and Sustainable Finance
4. Industry project on market infrastructures

The second residential week addresses the practical application to market infrastructures of these principles to effectively integrate theory and practice.

The blended structure incorporates the advantages of both online and classroom learning. It offers the flexibility to adapt your learning to your schedule while providing opportunities to engage with colleagues from diverse backgrounds, fostering interaction and networking.

"The MIC programme is a great way for participants to add to their knowledge, generate ideas and analyse the industry. It offers a wide approach to possible new business opportunities in local markets, as well as the chance to form strategic alliances with valuable connections, and it has added value to my career and my personal development."

Juan Manuel Olivo Tirado,
Promotion and Issuers Director,
Bolsa Mexicana de Valores



The World Federation of Exchanges

The World Federation of Exchanges (WFE) is the global industry group for exchanges and clearing houses (CCPs) around the world. It represents over 250 market infrastructures ranging from those that operate the largest financial centres to those that run frontier markets.

The WFE membership spans the seven continents with 34% of its members located in Asia-Pacific, 45% in EMEA and 21% in the Americas. WFE's 91 members CCPs collectively ensure that risk takers post some \$1.3 trillion (equivalent) of resources to back their positions, in the form of initial margin and default fund requirements. WFE exchanges are home to 57,656 listed companies, and the market capitalization of these entities is over \$101.17 trillion;

around \$146.29 trillion (EOB) in trading annually passes through WFE members (at end 2022).

Founded in 1961, the Federation was set up to contribute to "the development, support and promotion of organised and regulated securities markets in order to meet the needs of the world's capital markets in the best interests of their users." This remains the WFE mandate today.

As part of its mission, the WFE seeks to educate stakeholders on how exchanges and CCPs serve the economy and to ensure that technology is an enabling, effective and powerful force for good.

The WFE seeks to ensure regulatory outcomes that foster well-functioning capital and derivatives markets, reinforce systemic stability, and contribute to market development. Together with its members it creates and agrees best practices and standards for the industry.

"The WFE's unique position in the exchange and CCP universe enables us to produce a timely and topical programme which will give professionals a deeper understanding of every aspect of the industry. We look forward to welcoming our next cohort of MIC candidates. The MIC will enable them to progress their careers. It's important for everyone working in finance to be able to understand the market infrastructures that underpin the global financial system and economies."

Nandini Sukumar, Chief Executive Officer, World Federation of Exchanges





Programme structure

The programme features two components: an online and a residential component. You will be expected to take a global approach to your study, learning from the perspectives of your colleagues in other countries as well as your lecturers.

Teaching and learning methods include the opportunity for you to apply your knowledge and expertise to problems beyond those generally encountered in your daily jobs/tasks. A range of teaching and learning strategies are used to help you meet the different learning outcomes and to cater for the varied backgrounds and experiences of you and your fellow delegates.

You are required to take four core modules:

- Payments and market infrastructures
- Exchanges, Asset classes and Market Micro-structure
- Regulation, Ethics and Sustainable Finance
- Industry Project on market infrastructures

All modules are designed and taught by leading Bayes academics. The online component of the programme is delivered through our virtual learning platform so that everything you need is online and in one place. Modules are broken down and presented so you can learn in digestible, sequenced steps. Within each topic, online lectures and

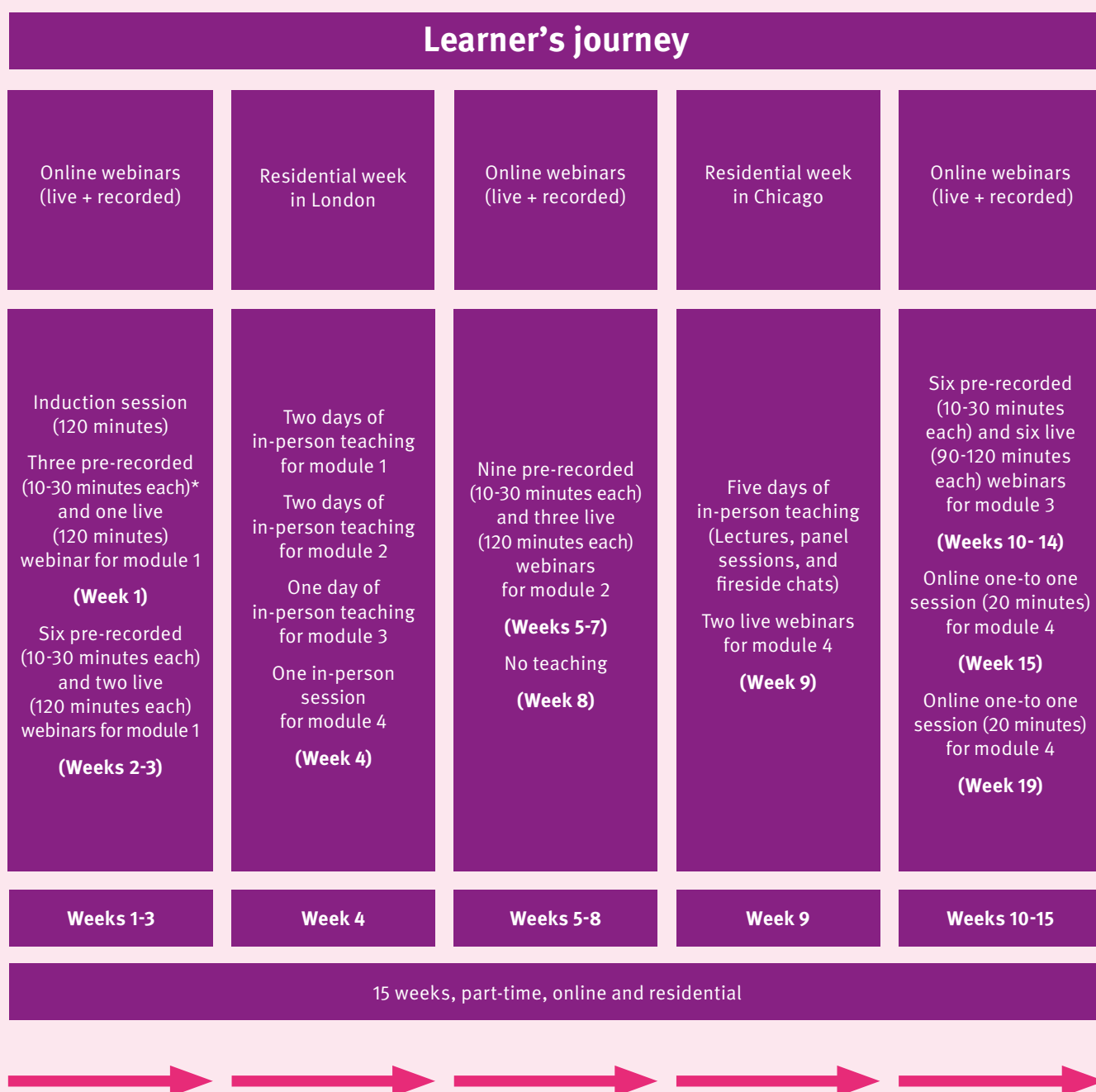
presentations are supplemented by core readings and other resources in order to prepare you for weekly live lectures and help you consolidate your learning. You will be invited to participate in group discussions and exercises on your own or with small groups of other students, you will be able to test your learning as you go and receive regular, constructive feedback.

The postgraduate Market Infrastructure Certificate is designed to allow for intellectual progression, module by module. Each module provides a discrete block of knowledge and skills, building towards the overall award of the Certificate. Typically, as a holder of this qualification you should have the qualities and transferable skills required to facilitate ongoing professional development in the area and engage successfully in a complex work environment.

Approximately 10 teaching and learning hours, including both contact and non-contact hours, are necessary for each credit granted. In the case of modules worth 15 credits, this amounts to a total of 150 learning and teaching hours. These hours account for the indicative amount of time you should spend studying on the module and will be made up of contact time with your lecturers and tutors, and non-contact time which you will use for independent study (such as subject research, reading and completing assignments and other homework).

The precise weighting of different types of learning and teaching depends on the module and the breakdown is therefore provided within the appropriate module specifications.

Figure 1



*Number and length of pre-recorded webinars subject to alterations.

Academic certification

Postgraduate Certificate

MIC is a rigorous study programme for committed part-time participants.

A postgraduate certificate is at the same level as an MSc but is shorter and does not require the completion of a research project or dissertation.

These qualifications are useful for those students looking to improve their skills and develop their CV.

Participants who successfully complete the programme will be awarded a postgraduate certificate and receive 60 credits at Higher Education level 7 in the UK.

Each module is worth 15 credits, and you will need to pass four modules to successfully complete the MIC. With each module accounting for 15 credits, this translates to a cumulative requirement for 150 learning and teaching hours per module.

Throughout the programme, you will be expected to dedicate a total of 600 learning and teaching hours. These hours encompass time spent with faculty, as well as independent study for subject research, reading, assignments, and other coursework.

Applicant eligibility

The MIC programme has been specifically designed to cater to professionals at central banks, buy-side and sell-side firms, exchanges, clearing houses and regulatory bodies seeking for a deep and comprehensive understanding of the functioning and role of market infrastructures.

To be eligible for the MIC programme, applicants are required to have a minimum of four years of full-time relevant work experience or hold a graduate degree. In cases where participants do not possess a graduate degree in a quantitative field such as Economics, Finance,

Mathematics, or Engineering, it is essential that they feel comfortable accessing quantitative formulas and have a robust knowledge of finance in order to engage effectively with the programme content. Additional examples illustrating this requirement can be found in the Frequently Asked Questions (FAQs) of the programme, available at the MIC website.

The selection process for the MIC programme is carried out by the WFE and aims to identify candidates who exhibit not only a strong academic background or work experience but also demonstrate leadership potential and a genuine drive to effect positive change in their respective home countries.



University partner

Bayes Business School (formerly Cass), City, University of London



Professor Barbara Casu

Professor of Finance

Director for the Centre of Banking Research at Bayes Business School (formerly Cass)

Module lead for Payments and Market Infrastructures

"I'd recommend WFE's Postgraduate Certificate to anyone wanting to broaden their understanding of Market Infrastructure, from payments and asset classes to regulation and ESG. The course was professionally delivered by City University with a wide range of high-calibre speakers from across the industry. I was also lucky to be part of a lively and talented cohort, who I now call friends."

Hetal Patel, AVP, Head of Marketing, European Markets, Nasdaq

Bayes Business School (formerly Cass) is a leading global business school in the City of London, with state-of-the-art facilities on the executive education campus where the London residential week of the MIC programme will be held. Bayes are known for their world-class business education, excellent research reputation, and their deep engagement with practice. Bayes are part of City, University of London.

Bayes focus on teaching our students how to think, not what to think. They challenge their community to be persistently curious, ask important questions, and be responsive to new information and adapt their thinking accordingly.

The Bayes approach balances theory and practice. Students apply what they learn to real-life business challenges to see the impact learning has. World-leading faculty works closely with industry leaders so as to equip students with the insights, skills and confidence they need to thrive in the dynamic business world.

Bayes Business School is among the global elite of business schools that hold the gold standard of 'triple

crown' accreditation from AACSB, AMBA and EQUIS, as expressed through rankings:

- 25th best globally Msc in Finance (Financial Times Masters in Finance ranking 2021)
- 2nd best in Europe for research in finance (Financial Times MBA in finance ranking 2018)
- 1st in London for Careers Service rank and graduate employment rate (Financial Times Masters in Finance ranking 2021)
- Top 10 globally for options and futures (Financial Times Masters in Finance ranking 2018)
- Top value for money MBA in London (Financial Times Global MBA ranking 2021)
- 5th best globally for entrepreneurship (Financial Times MBA in entrepreneurship ranking 2018)
- Lowest alumni gender pay gap in the UK (Financial Times MBA for women ranking 2018)

Full details on school rankings are available at www.bayes.city.ac.uk/about/our-rankings

Learning outcomes of the programme

On successful completion of the programme, participants will be expected to have acquired the following tools:

Knowledge and understanding

- A broader and deeper knowledge of how MIs operate, their interrelations, their regulatory environment, and their role in achieving financial stability and supporting sustainable and inclusive economic growth
- Evaluate retail and institutional markets
- Evaluate large value payment systems
- Assess the implications of recent financial innovations (for example cryptocurrencies, fintech)
- Explain the reasons why securities' prices move and be able to relate such observables to the way markets are organized
- Debate the role of regulation, ESG and ethics in the working of modern exchanges and MIs
- Understand the inherent conflicts of interest involved in operating market infrastructures.

Skills

- Apply knowledge and understanding to complex issues, both systemically and creatively, so that theory is converted into practice from a critical and informed perspective, thereby enhancing organisational effectiveness and competitiveness
- Communicate effectively using the full range of media (including listening and presenting), working both individually and in groups / teams
- Conduct research that builds on and/ or creates new knowledge. This will involve collecting, scanning, organising and analysing data to produce reliable conclusions, and then disseminating knowledge
- Network with peers across different member firms in the WFE and other professional organisations.

Values and attitudes

- Demonstrate an ethical approach to working in a variety of situations
- Demonstrate assurance, confidence, and self-awareness in your ability to apply the skills and knowledge learned in the programme
- Advise management on a wide variety of issues and ethical dilemmas impacting their organisations
- Articulate an awareness of the “bigger picture” global context when advising on / making strategic decisions



Professor Giovanni Cespa, Academic Director of the MIC

Detailed description of module 1

Payments and Financial Markets Infrastructures

Markets infrastructures (MIs), among other functions, allow the clearing, settlement and recording of financial transactions and enable millions of transactions to take place every day. For example, they enable payments into people's bank accounts, they ensure that shares bought and sold are transferred securely and efficiently; and they allow banks to access funds in the wholesale markets.

MIs have a critical role to play in making financial transactions more efficient and helping to manage risk in the system, ensuring the smooth and stable functioning of markets.

The MIs network includes the payment system, securities clearing and settlement systems (SSSs), central securities depositories (CSDs), and central counterparties (CCPs). Regulators have recognised the pivotal role of MIs, and the regulatory scrutiny is increasing, due to the developing complexity and interconnectedness of markets. This module aims to foster the understanding of the functioning of the MI's network and of the key developments and opportunities, as well as of the emerging challenges it faces.

The content of this module will build upon four main topics: (1) Money and payments; (2) Large value payments, cross-border payments, and the correspondent banking system; (3) Financial markets infrastructures: central securities depositories, securities settlement systems and CCPs; and (4) Innovation: cryptocurrencies, DLT, central bank digital currencies.

TOPIC 1 Money and payments

The first topic will introduce the payment systems and the infrastructure necessary for payments. It will cover retail payments (including consumer to consumer (C2C), consumer to business (C2B) and business to business (B2B); automated clearing houses (ACH) and communication networks. Payment infrastructures are a key part of a country's financial system and are regulated to ensure financial stability. We will introduce the key principles of regulatory oversight, focusing on systemically important payment systems (SIPS).

TOPIC 2 Large value payments

The second topic will cover wholesale and cross-border payments, and the correspondent banking system. We will introduce the role of SWIFT and the rationale for the oversight of SWIFT.

TOPIC 3 Financial market infrastructures

The third topic will introduce a range of FMIs, including Securities Clearing and Settlement Systems (SSSs), Central Securities Depositories (CSDs) and Central Counterparties (CCPs). We will then cover the key principles of regulatory oversight, the standards of oversight and the conduct of regulatory oversight in relation to central securities depositories, securities settlement systems and CCPs.

TOPIC 4 Innovation

In our fourth and final topic, we will focus on innovations in the payment space and will introduce cryptocurrencies, distributed ledger technology (DLT), and central bank digital currencies. We will discuss key issues with emerging technologies, ranging from security to scale to cyber risk and financial stability.

"The residential weeks were hugely beneficial and the highlights of the entire course for me and many of my peers. The quality and breadth of speakers that the WFE and Bayes were able to source was exceptional. This included CEOs and senior executives from a number of exchanges, including Cboe, regulators (both the FCA and the Federal Reserve), market makers, buy side and sell side, helping bring together the content in a practical manner and helping the cohort better understand what each client segment wants from a market infrastructure provider."

Stephen Dorrian, Head of Market Data & Access Services, Europe, Cboe

Detailed description of module 2

Exchanges, Asset classes and Market Micro-structure

Exchange market structures differ across the world. However, they all aim at the same objective, which is to facilitate the efficient allocation of capital to productive activities through (i) the listing of firms' shares, (ii) the organization of risk transfer via derivatives, and (iii) the dissemination of valuable security information, through the sale of market data. Building on this insight, this module starts by reviewing the main instruments and contracts that are traded in an exchange.

It then focuses on the effect that trading rules, market organization and market "frictions" have on securities price formation, measured along the two-standard metrics of market quality: price discovery and liquidity. It finally turns to analyse how such metrics have been impacted by recent trends such as market electronification, and concludes with a discussion of what the future is likely to hold in this respect.

TOPIC 1 Investments and asset classes

- Debt, equity and derivative securities
- The general principles for determining the price of a financial asset
- Equity indices and their construction
- Pricing of forwards, futures, options, and swaps

TOPIC 2 Market Microstructure (I): Exchanges

- Centralized and decentralized market structures
- Types of orders: liquidity demand and liquidity supply
- Market participants (Brokers/Dealers, Institutional investors, High Frequency/Algorithmic traders, retail traders)
- Call/Batch auction and continuous auction
- The workings of a Limit order book (LOB)
- The workings of a dealership market
- The informational role of a market

TOPIC 3 Market Microstructure (II): The trading process

- Measures of market quality: liquidity and price discovery
 - i. Market quality definitions and relevance
 - ii. Measures of liquidity
 - iii. Price discovery
- Determinants of market quality
 - i. Privileged information and its impact on trading
 - ii. Adverse selection
 - iii. Order processing and inventory costs
 - iv. Implications for market quality
- Market transparency
 - i. Pre- and post-trade transparency
 - ii. ECN and "dark" trading
 - iii. Implications for market quality

TOPIC 4 Recent trends

- (I) Electronification
 - i. Competition among trading venues
 - ii. Regulating competition among venues (RegNMS and MiFIDs)
 - iii. The importance of market data sales
 - iv. The advent of computerized trading: pros and cons
- (II): Distributed ledgers and tokenisation
 - i. Definitions and rationales
 - ii. Implications for risk sharing and order processing costs

Detailed description of module 3

Regulation, Ethics and Sustainable Finance

Financial executives, companies, and market infrastructures do not make decisions in a vacuum. The combined effect of the 2008 global financial crisis, growing political activism, and the current climate emergency has placed financial institutions under increasing public scrutiny, media comment and a new regulatory environment.

As a result, there is now greater pressure on those working in financial services to factor-in the cost of the environmental, societal and governance (ESG) consequences of their decisions, as well as demonstrate evidence that they meet ethical norms and act with integrity.

In this module, you will explore the issues around ethical behaviour in financial institutions and, focusing specifically on market infrastructures, the compliance and regulatory frameworks and the current trends in ESG.

TOPIC 1 Ethics in financial institutions

- Explore the significance of ethics within financial organisations
- Learn frameworks in moral philosophy to guide decision making
- Gain insights into adopting ethical frameworks to the setting of market infrastructures
- Understand the implications for hiring, promoting, and leading others within financial services
- Understand the ethical issues facing market infrastructures.

TOPIC 2 Environmental, Social, Governance (ESG)

- Learn the evolving landscape of sustainable finance to broaden your understanding of ESG, sustainable finance, and the complexities faced by investors and market participants
- Explore the rapid growth of ESG engagement, where shareholders directly participate in corporate affairs, and its effects on financial market participants
- Gain insights into the development of sustainable finance intermediaries, their controversies, and regulatory attention
- Uncover the industry ideal of ESG integration, combining financial portfolio techniques with environmental, social, and governance criteria
- Investigate the core activity of responsible investors—screening—and its philosophical underpinnings, while addressing the limitations and challenges it presents.

TOPIC 3 Regulation and compliance

- Understand that market changes in the financial industry has resulted in the emergence of self-regulation and government regulation. In parallel, the compliance departments within banks and financial organisations have experienced notable expansion since the global financial crisis
- Focus on examining the current trends in regulation and compliance specifically within market infrastructures
- Gain insights into the implications they have for market infrastructures. You will cover topics such as regulatory frameworks, compliance requirements, and the evolving role of market infrastructures in ensuring adherence to regulatory standards.



Detailed description of module 4

Industry Project on market infrastructures

The Industry Project is the final component of the Market Infrastructure Certificate (MIC), taking place after the taught modules have been completed and with work on it being conducted during and after your industry week.

The module is designed to help you integrate your learning from across the programme and “connect the dots” between theory and practice.

It will also help to develop your ability to plan and execute market-relevant research, addressing a real problem or issue, which you will conceive and work through as part of your industry experience. During the industry residential week, you will have the opportunity to choose a topic(s) from suggestions provided to you, or you can choose your own. You will be supported by your module leaders and the presenting practitioners to choose the right one.

The research is to be conducted individually and is intended to provide an integrating component for the academic and practitioner-led sides of the MIC programme.

The research should focus on a relevant issue in market structure/ design/ operation. You will be required to collate and integrate relevant literature, apply theoretical knowledge to the problem identified and use appropriate empirical tools. Finally, you will need to evaluate the results and also to reflect on the strengths and shortcomings of your work.

The work on this module will be conducted collectively. This will be supported by sessions with the module leader and webinar hours in which the project work is introduced and, later, project finalisation is discussed.

During your industry experience week in the field, you will have the opportunity to develop the research agenda for the project and gather essential primary data. This process involves conducting observations, reviewing pertinent literature, and initiating the articulation of your initial findings.

Chicago Board Options Exchange (CBOE)

Industry residential week

The industry residential week will take place in Chicago, where participants will spend a week at CBOE Global Markets, the parent company of the Chicago Board Options Exchange (CBOE) and of other major markets around the world. The CBOE is one of the world's largest and most renowned options exchanges. Founded in 1973, the CBOE is located in the heart of Chicago's financial district and has played a pivotal role in shaping the options market.

The residential week, which is a component of module 4, has been designed to enable participants to effectively integrate theory and practice. This experience serves as a platform for participants to

synthesise and apply the learning they have acquired so far, by engaging in various activities carefully selected to enhance their understanding and knowledge of the programme's content. These will include lectures, panel sessions, and mentoring. Industry leaders and senior regulators will lead the discussions, which will focus on the practical aspects of the industry, providing opportunities to deepen acquired knowledge and apply theoretical concepts to practical scenarios. They will also host fireside chats; these intimate sessions will allow participants to engage in open and candid discussions, gaining insider perspectives on market infrastructures. Together with the panels and lectures, the fireside chats will provide a unique opportunity for participants to ask questions, exchange ideas, and learn from other markets' experiences.

This has been added: These sessions will focus on practical aspects of the industry:

- Markets and product design
- Primary markets and listings
- Risk management in clearing (margining practices and models)
- Operational risk (e.g., transition to the cloud)
- Current regulatory challenges
- The impact of new technologies (crypto platforms, AI, cloud solutions)
- Differences between developed and emerging & frontier markets. Sequencing
- Managing conflict of interests: the role of governance
- MIs and national development
- The role of MIs in advancing the sustainability agenda
- Role of international organizations.

The Old Post Office, CBOE building



World Federation of Exchanges

125 Old Broad Street London
EC2N 1AR United Kingdom
T: +44 (0) 20 7151 4150
www.world-exchanges.org

Bayes Business School

106 Bunhill Row
London EC1Y 8TZ
T: +44 (0)20 7040 8600
www.bayes.city.ac.uk



BayesBusinessSchoolOfficial



Bayes-Business-School



@BayesBSchool



BayesBSchool



@BayesBSchool



All the information contained within this brochure was correct at the time of going to print.

City St George's, University of London is an independent member of the University of London which was established by Royal Charter in 1836. It consists of 17 independent member institutions of outstanding global reputation and several prestigious central academic bodies and activities.



**UNIVERSITY
OF LONDON**

