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Programme Specification (PG)

Awarding body / institution:	Queen Mary University of London
Teaching institution:	Queen Mary University of London
Name of final award and programme title:	MSc Finance and Machine Learning
Name of interim award(s):	Postgraduate Certificate (PGCert) Postgraduate Diploma (PGDip)
Duration of study / period of registration:	1 Year full time
Queen Mary programme code(s):	
QAA Benchmark Group:	N/A
FHEQ Level of Award:	Level 7
Programme accredited by:	
Date Programme Specification approved:	
Responsible School / Institute:	School of Economics and Finance

Schools / Institutes which will also be involved in teaching part of the programme:

Collaborative institution(s) / organisation(s) involved in delivering the programme:

Programme outline

The recent advancements in the fields of econometrics and computer science have spurred interest in complex statistical learning methods both in finance and economics. This course couples a solid training on mainstream finance topics with a deep understanding of so-called machine learning methodologies for the analysis of financial markets. This specialists course extends a typical Finance postgraduate course by focusing on the use of statistical learning for investment decisions, risk management, as well as the development and engineering models for the analysis of "Big Data". This taught course is aimed for students with a solid quantitative background which however may not have been extensively exposed to computer programming. If you want to become a specialist in applying machine learning methods in finance, this course will provide a first crucial step towards that goal. Study areas include, econometrics, time-series analysis, computer programming, statistical and probability theory, in addition to mainstream topics in finance such as asset pricing, corporate finance and investments. The taught program is aimed at two types of audiences. First, to graduate students who wish to pursue their studies in quantitative finance with a view towards risk analytics and investment management. The second target groups are professionals from the financial services industry who either seek to pivot towards methods that are based on machine learning or are simply interested in these new tools and want to upgrade their set of competences.

You'll study in one of the UK's leading research departments, and contribute to our renowned research culture with your own independent project at the end of the course of study. You will benefit from cutting-edge research-led teaching, with the

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department research strengths, such as asset pricing, financial econometrics and investments.

Aims of the programme

The program aims to give students:
• a strong background in finance
• grounding in machine learning methods and how they are used in finance through cutting-edge curriculum.
• the knowledge to implement machine learning tools using Python.
• a learning environment which encourages the development of systematic and independent thought and learning
• a methodical knowledge of quantitative methods so that they will have the skills necessary for them to undertake quantitative analyses of relevant problems

What will you be expected to achieve?

Upon successful completion of this course, you will have the expertise to develop and engineer complex statistical learning algorithms for the analysis of financial markets. You will understand the role of machine learning in a modern investment environment, and you will be able to analyse financial data and build risk models, detect trends in financial markets, test a given hypothesis and forecast future values. You will also understand how to build an investment portfolio (of risky assets) and carefully monitor its performance over time.

Academic Content:	
A1	Develop a core understanding in Asset Pricing, Corporate Finance and Risk Management.
A2	Develop, validate, and use effectively machine learning and statistical models.
A3	Work with structured, unstructured, and time-series data.
A4	Work with methods and techniques such as clustering, regression, support vector machines, boosting, decision trees, and neural networks.
A5	Develop and use prediction algorithms, including predictive strategies for dynamic investment.
A6	Complement predictions with provably valid measures of accuracy and reliability.
A7	Work with software packages such as Python and R.

Disciplinary Skills - able to:	
B1	To reason analytically using complex statistical models.
B2	To access a wide range of research literature and critically evaluate it.

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B 3	To critically assess empirical evidence and understand its importance in the process of investment decision making and risk management.

Attributes:	
C 1	To conduct in-depth, independent research on a given topic.
C 2	To provide solid arguments based on empirical and theoretical findings from the literature.
C 3	To analyse critically problems arising in both academic and non-academic environments.

How will you learn?

The learning outcomes for the programme are delivered by a range of modules across the programme. Teaching and learning is mainly via expert lectures and seminars. Teaching and learning strategies vary from module to module. Compulsory material is introduced in the compulsory semester A and semester B modules. Assessment is by a variety of methods including formal examinations, in-class tests, coursework of various forms, presentations, independent dissertation. Most modules will have two methods of assessment. Students will make full use of QMplus, Qengage, ebooks, and library resources
Students are expected to use independent /self directed study time to achieve the learning outcomes, such as preparing for sessions and follow up work, wider reading around the subject. Students will have support classes for most modules and access to teaching assistant office hours. Additional optional modules, outside of the programme diet, will also be available to students to help build upon professional skills.
Students will be expected to complete between 12 - 15 hours contact time and the same again independent study each week

Throughout the whole academic year students are encouraged to undertake independent reading both to supplement and consolidate what is being taught and learnt and to broaden their individual knowledge and understanding of the subject.

Practical and computational skills are developed through coursework, the research project work and through interaction with the other research students and the project supervisor.

Technical reports and presentations are taught and developed through workshops and feedback on written coursework, progress reports of the research project and presentations.
Use of the scientific literature is introduced by the Library during the induction week and then developed by academic staff through lectures, coursework, and reports of the individual supervised special project.

Transferable skills are built up through the teaching and learning programme outlined above. Effective communication is taught and assessed through workshops and feedback on the research project reports and oral presentations. It is assessed through coursework, written examinations and project work. Applying knowledge and financial models in real life problems is taught through lectures and is developed during individual research project.

Usage of information and communications technology is developed through workshops, computer based exercises, coursework activities, the research project and other and individual learning.

Management of recourses and time is developed throughout the course within a framework of coursework deadlines and the examination system. Moreover, the programme is structured and delivered in such a way as to promote independent learning and critical enquiry.

Throughout the research project what is being taught and simultaneously assessed is management skills the integration and evaluation of information from a variety of sources, and the transfer of knowledge techniques and solutions from one discipline to another.

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How will you be assessed?

The grade for each module is assessed through a combination of assessed group and individual coursework, and unseen written examinations in January and May.

During the summer period, supervised by a faculty member, students will have to complete a 45 credit dissertation or 15 credit research project on the topic of Machine Learning. It is assessed, on the basis of the individual literature review, main report and presentation, initially by the supervisor, before its final stage by the team of all supervisors and then by the External Examiner and the full Examination Board.

How is the programme structured?

Please specify the structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

Students are offered a two-week pre-sessional course whose aim is to introduce students without a strong quantitative background to the necessary mathematics and statistical concepts.

The programme consists of four compulsory modules in Semester A [=75 credits] as well as two compulsory module plus two 15-credit elective modules, from a predefined list, in semester B [=60 credits].

During the summer period, supervised by an academic member of staff, students can choose between the 45 credit Dissertation (ECOM107) or the 15-credit Research Project (ECOM200). The latter will allow students to choose two 15-credit elective modules, again from a predefined list, in Semester C [thereby giving them the 45 credits they will need to complete their MSC].

The predefined list of elective modules, submitted annually to the Academic Registry, are subject to change year-on-year due to operational needs, staff availability, etc.

Academic Year of Study   FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Corporate Finance	ECOM015	15	7	Compulsory	1	Semester 1
Asset Pricing, Trading and Portfolio Construction	ECOM155	30	7	Compulsory	1	Semester 1
Introduction to Machine Learning	ECOM197	15	7	Compulsory	1	Semester 1
Quantitative Methods in R	ECOM213	15	7	Compulsory	1	Semester 1
Big Data Applications for Finance	ECOM151	15	7	Compulsory	1	Semester 2
Large Language Models and Textual Analysis in Finance	ECOM217	15	7	Compulsory	1	Semester 2

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Dissertation	ECOM107	45	7	Compulsory	1	Semester 3
Research Project	ECOM200	15	7	Compulsory	1	Semester 3

What are the entry requirements?

A 2:1 or above at undergraduate level in any subject, provided there is a strong quantitative background in Statistics and Mathematics.

The English Language requirements for entry to postgraduate taught and research programmes in the School of Economics and Finance falls within the following English band:

Band 4: IELTS (Academic) minimum score 6.5 overall with 6.0 in each of Writing, Listening, Reading and Speaking

We accept a range of English tests and qualifications categorised in our English bands for you to demonstrate your level of English Language proficiency. See all accepted English tests that we deem equivalent to these IELTS scores.

How will the quality of the programme be managed and enhanced? How do we listen to and act on your feedback?

The Student Voice Committee provides a formal means of communication and discussion between schools/institutes and its students. The committee consists of student representatives from each year in the school/institute together with appropriate representation from staff within the school/institute. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Student Voice Committees meet regularly throughout the year.

The School operates an Education Committee, or equivalent, which advises the School/Institute Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in the committee's work in a number of ways, such as through student membership, or consideration of student surveys.

Thes School operates a Programme Review of their taught undergraduate and postgraduate provision. This is a continuous process of reflection and action planning which is owned by those responsible for programme delivery and work throughout the year to monitor academic standards and to improve the student experience. Students' views are considered in this process through analysis of the NSS and module evaluations.

What academic support is available?

Students will be fully inducted over a two week period with various activities and support available. Students will be assigned personal Advisor, a Programme Director and a co-odinator of MSc programmes.
Students are able to see these members of staff during advertised office hours and through organised meetings at key times of the academic year, such as induction.

Programme-specific rules and facts

Standard HSS Academic Regulations

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How inclusive is the programme for all students, including those with disabilities?

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:
• Finding out if you have a specific learning difficulty like dyslexia
• Applying for funding through the Disabled Students' Allowance (DSA)
• Arranging DSA assessments of need
• Special arrangements in examinations
• Accessing loaned equipment (e.g. digital recorders)
• Specialist one-to-one "study skills" tuition
• Ensuring access to course materials in alternative formats (e.g. Braille)
• Providing educational support workers (e.g. note-takers, readers, library assistants)
• Mentoring support for students with mental health issues and conditions on the autistic spectrum.

Links with employers, placement opportunities and transferable skills

This programme will have an advisory panel drawn from the investment banking industry.

The School takes student placement very seriously. We have a dedicated Careers Consultant for the School of Economics and Finance. We have recently increased our team to include a full time, dedicated Internships Co-ordinator.

Our MSc courses are full academic programmes. In addition, students have the option of complementing their studies with our additional ungraded modules, for example the Financial Trading Programme. These modules tend to be delivered by highly experienced industry practitioners.

Programme Specification Approval

Person completing Programme Specification:	Sarah Riley
Person responsible for management of programme:	Daniele Bianchi
Date Programme Specification produced / amended by School / Institute Learning and Teaching Committee:	30 Oct 2024
Date Programme Specification approved by Taught Programmes Board:	

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