



Proposal for New Degree Programmes

Stage 2

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	<p style="text-align: center;">THE UNIVERSITY OF EDINBURGH</p> <p style="text-align: center;">PROGRAMME SPECIFICATION FOR MSc in <i>Advanced Technology for Financial Computing</i>¹</p>
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PROGRAMME SPECIFICATION

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OVERVIEW	
Awarding Institution	The University of Edinburgh
Teaching Institution	The University of Edinburgh
Programme accredited by	N/A
Final Award	MSc

¹ The information contained in this Programme Specification should be used as a guide to the content of a degree programme and should not be interpreted as a contract.

Programme Title	Advanced Technology for Financial Computing
UCAS Code	N/A
Relevant QAA Subject Benchmarking Group(s)	Computing(Master's)
Postholder with overall responsibility for QA	Stuart Anderson Tiejun Ma and Valerio Restocchi
Date of Production/revision	Date of production: May 2019 Latest revision: 15 Nov. 2019

EXTERNAL SUMMARY

The MSc in Advanced Technology for Financial Computing will provide students with a critical and practical appreciation of how new data and computing technologies can be used and developed to deliver value in organisations with finance related digitalisation from both technology and business management perspectives. The move towards the digital organisations offer great potential for small and large, public and private enterprises alike. Exploiting latest digital technologies for technology and finance related industries have become one of the key strategic goals for organisations today. Digital solutions are the confluence of enterprise systems, mobile systems, the Internet and analytics in a data-intensive environment that underpins current approaches to the creation, implementation, delivery and evolution of products, processes, services and experiences (Gartner 2015). In recent years, new digital technologies have become important enablers of new kinds of products and services, and new forms of business models. Business and technology sectors are finding radical new ways to work together, interact with their customers, and organise their complex supply chains and production networks. This includes how private and public organisations increasingly interact online with customers, partners, suppliers and other stakeholders.

A recent study by Altimeter Group found that while nearly 90% of companies surveyed were undergoing a digital transformation, only one-quarter had a clear understanding of what their digital strategy should be. A MIT study found that nearly 80% of executives surveyed think that digital transformation is critical to their organisation. Organisations undergoing such digital transformation face difficult problems and barriers which are neither simply technical nor organisational in nature, but which require an integrated understanding. Those attempting to manage digital technologies face important challenges both from a technology (i.e. computing, resilience, scale, data and technological integration, communication) and a business/management viewpoint (i.e. managing and integrating the new forms of information technologies with the people and organisations in a way that supports the strategic business objectives). The challenge today is further compounded because organisations are not simply attempting to deal with internal issues - to integrate their 'front office' and 'back' office - but also to connect and integrate with technologies that are outside of their control (e.g., to link to smart phones or to social media or to embedded software).

The teaching team of the MSc in Advanced Technology for Financial Computing lined up with world class researchers and educators. In particular, the University has been awarded £1.3 billion in recognition of its critical mass in leading edge data-driven innovation and become the data capital of Europe and Edinburgh is one of UK's leading data science innovation centres.

The overall programme delivers intellectual and practical experience in advanced computing technologies related to banking, finance, insurance and business sectors in general: dealing with real-world applications; applying and extending state of the art technology; engineering end-to-end business and financial systems; communicating results through oral and written reports.

EDUCATIONAL AIMS OF THE PROGRAMME

- It will be delivered wholly on campus within UoE with strong links to existing centres of research excellence across Informatics and Business School.
- It will creatively integrate technical and management components to provide students with an enhanced and comprehensive understanding of the potential advantages and stumbling blocks advanced enterprise informatics present to organisations as they attempt to realise the digital technology and financial organisations.
- It is targeted at both fresh talent and experienced employees working in digital organisations.
- Equip students with advanced computer-based scientific, engineering and industry related skills;
- Provide a programme of study that benefits from our research strengths across the disciplines;
- Enable students to develop communication skills, initiative, professionalism and the ability to work independently as well as with others; and
- Provide graduates with the knowledge and skills necessary for professional careers or for postgraduate research.

PROGRAMME OUTCOMES

Knowledge and Understanding

- Understand finance-related computing and data technologies in a broad context;
- Understand the process of building a financial application in all its levels and stages and be able to demonstrate this understanding in supervised system building efforts;
- Have advanced knowledge of the state of the art in research in advanced technologies for financial computing systems and business applications;
- Know the main research methodologies used in financial computing and data-driven analytics;
- Understand advanced knowledge of multi-disciplinary financial system engineering and recognise the importance of a multi-disciplinary approach to addressing financial computing and technologies challenges;
- Understand interdisciplinary research in both advanced computing technologies and practise in business sectors;

	<ul style="list-style-type: none"> • Have transferable research skills and interdisciplinary knowledge for a wide range of information and technology, research and policy careers; • Have ability to assess and manage both technology and financial risk management in business environments; • Advanced understanding of the computing technologies, risk management as they apply to industry environments; • Have ability to identify research question(s) and conduct experimental or theoretical research, and to present the findings in a clear, professional manner; • Understand advanced computing technologies in finance related context by undertaking a significant individual project, where possible with industrial partners; •
Graduate Attributes: Skills and abilities in Research and Enquiry	<ul style="list-style-type: none"> • Advanced literature review and analysis skills. • The ability to specify a research question and identify the relevant background literature, legal and ethical constraints and issues. • Deploy logical, analytical, and problem-solving skills and to synthesise solutions. • Undertake a substantive project (3-4 months) on the proposed topic • Develop skills needed for undertaking extended projects, including reviews, time management and writing extended reports.
Graduate Attributes: Skills and abilities in Personal and Intellectual Autonomy	<ul style="list-style-type: none"> • Show self-direction and time management skills when working independently. • Make effective use of learning materials and to acquire and apply knowledge from a variety of sources. • The ability to work to strict deadlines and employ effective time management.
Graduate Attributes: Skills and abilities in Communication	<ul style="list-style-type: none"> • Develop proposal writing skills • Write an extended research-style report. • Communicate effectively through a variety of media including oral, written, diagrammatic and on-line

Graduate Attributes: Skills and abilities in Personal Effectiveness	<ul style="list-style-type: none"> • The ability to work effectively as a team member with people from different cultural contexts.
Technical/practical skills	<ul style="list-style-type: none"> • Evaluate the level of advanced technical challenges associated with developing and managing financial system and be capable of deploying a wide range of mitigating mechanisms to overcome those challenges. • design and conduct data-driven experiments and evaluate their results • operate computing equipment and software systems with awareness of their financial applications effectively. • master new computing technologies quickly as the need arises for financial systems • make effective use of a wide range of state-of-the-art technologies (e.g. in relation to Usability, Distributed Ledgers, Data Mining, Sentiment Analysis, Behaviour Analysis, High Performance Computing etc.)

PROGRAMME STRUCTURE AND FEATURES

The programme is born out of a highly novel collaboration between two world leading academic Schools within UoE. While Informatics is ranked 14th for the computer science department and Business School is ranked within top 50 worldwide according to QS 2017.

Not only is the MSc being developed in a way that students will be able to exploit the strong interdisciplinary synergies under development in this new joint initiative, but it promises to offer a new model for the development and delivery of postgraduate teaching offerings. Part of a developing research collaboration which will ensure that teaching insights and material are contemporary and at the cutting edge of business and informatics practice. One of the greatest challenges in this area is simply keeping up. Change in this domain is phenomenally fast. As part of the relationship described above, both Schools will work together to establish a new joint Business and Informatics collaboration group. The group will bring together scholars, students and practitioners within the Business and Computing domain to foster ideas, concepts, knowledge of: new processes for managing digital technology within organisations and across global and distributed organisational networks; new practices for open Innovation and collaboration within emergent technologies; and the creation of new Business Models for the Digital Economy.

A programme covering the emergent and highly relevant area of digital transformation and disruption: It is well documented that there is an increasing demand for skills and knowledge to deal with the challenges of emerging advanced information technologies, and those that hold the potential for the radical transformation of business. The practice orientation developed within this course, together with the strongly interdisciplinary nature of the proposed teaching offering, will allow us to create an

advanced programme based on real cases and scenarios and reflecting the complexity of real word problems and situations. The practice orientation will be achieved, for example, through project-based dissertations and industrial internship placements, as well as by offering distinctive modules that draw across different disciplines.

An integrated programme, providing a unique blend of advanced technical and business skills: The programme is one of the few in the UK to offer an in-depth account of technical challenges associated with the confluence of various information technologies. Such an integrated perspective is scarce in this area, with most existing IT oriented programmes focusing on the technical side, with little efforts to clarify the management skills required to ensure the effective exploitation of technological solutions in organisations. The programme described here has been designed to blend the informatics and business with emphasis on finance elements, providing the students with a unique interdisciplinary perspective of the challenges associated with advanced technology development/management. While the computing courses build up the required technical skills, the finance related courses develop the ability of students to understand the finance system management issues associated with the development, implementation and exploitation of such technical solutions.

Programme Structure

This one-year degree consists of two components: (1) approximately 7 months of taught courses in 2 semesters; (2) up to 4 months of project work leading to a dissertation. During the first taught part of the course, September to March, students attend lectures, tutorials and group work and acquire the theoretical foundation to enable them to engage in independent research. 120 taught course credit points are expected during the course of the year. All optional modules are offered subject to availability and timetabling constraints. The final dissertation project completes the MSc requirement of 180 credits overall. Between May and August, students complete the degree by making a practical application of their knowledge by undertaking a major individual research project on which they write a dissertation. The project is normally supervised by a member of academic staff as one of his/her research interests, with assistance from his/her research team.

a) SCQF credit points and levels for each constituent course and each year of the programme

The programme is delivered in a standard one-year, full-time, pattern where students spend semesters 1 and 2 completing 120 credits of taught courses and complete a 60 credit dissertation project over the summer with submission in mid-August. The following table captures the programme structure. Students have 60 credits of compulsory Informatics courses, choose 30 credits of Business School courses and another 30 credits of Informatics/Mathematics courses:

Code	Course	Semester	Credits	SCQF Level
Informatics Compulsory Courses (60 credits)				
New	Data-driven Business and Behaviour Analytics	1	20	11
INFR11136	Informatics Research Review	1	10	11
INFR11182	Introductory Applied Machine Learning	2	20	11
INFR11147	Informatics Project Proposal	2	10	11

Business School Courses (30 credits)				
CMSE11167	Introduction to Risk Management in Banks	1	15	11
CMSE11122	Credit Risk Management	2	15	11
BUST10144	Digital Business	2	15	10
Informatics/Math Optional Courses (30 credits)				
INFR11145	Text Technologies for Data Science	1&2	20	11
INFR11144	Blockchains and Distributed Ledgers	1	10	11
INFR11161	Natural Computing	1	10	11
INFR11020	Algorithmic Game Theory and its Applications	1	10	11
MATH11111	Fundamentals of Optimization	1	10	11
INFR11022	Distributed Systems	2	10	11
INFR11180	Artificial Intelligence, Present and Future	2	10	11
MATH11147	Large Scale Optimization for Data Science	2	10	11

Data-driven Business and Behaviour Analytics is the only new course required by the programme. The specification of this course accompanies this programme description. The novelty of the programme lies primarily in the synthesis of the material in the courses.

b) Entry requirements

A UK 2:1 honours degree, or its international equivalent, in informatics, artificial intelligence, cognitive science, computer science, electrical engineering, linguistics, mathematics, physics, or other numerate degree.

Competent programming skills are essential. During your degree you must have completed a programming course in at least one of the following: C/C++, Java, Python, R, Matlab, Haskell, ML.

During your degree you must have completed the equivalent to 60 credits of mathematics that have typically covered the following subjects/topics: calculus (differentiation and integration), linear algebra (vectors and multi-dimensional matrices), discrete mathematics and mathematical reasoning (e.g. induction and reasoning, graph theoretic models, proofs), and probability (concepts in discrete and continuous probabilities, Markov chains etc.)

English language requirements

You must demonstrate a level of English language competency at a level that will enable you to succeed in your studies, regardless of your nationality or country of residence.

English language tests

We accept the following English language qualifications at the grades specified:

IELTS Academic: total 6.5 with at least 6.0 in each component

TOEFL-iBT: total 92 with at least 20 in each section

PTE Academic: total 61 with at least 56 in each of the Communicative Skills scores

CAE and CPE: total 176 with at least 169 in each paper

Trinity ISE: ISE II with distinctions in all four components

Your English language qualification must be no more than three and a half years old from the start date of the programme you are applying to study, unless you are using IELTS, TOEFL, PTE Academic or Trinity ISE, in which case it must be no more than two years old.

c) Progression requirements

In order to progress to the Masters dissertation students must:

- (a) pass at least 80 credits with a mark of at least 50% in each of the courses which make up these credits; and
- (b) attain an average of at least 50% for the 120 credits of study examined at the point of decision for progression.

When all the marks for the taught components of the programme (120 credits) are available, if the student has achieved PASS marks in at least 80 credits and has an overall average of 40% or more over the full 120 credits, then they will be awarded credits on aggregate for the failed courses.

d) An explanation of the articulation of learning outcomes and assessment practices

Knowledge and understanding are acquired through a mixture of conventional classroom and lab-based lectures, tutorials and student-directed learning, backed up by a range of teaching activities, and assessed by means of written assignments, project reports and a dissertation.

Skills and abilities are acquired through a mixture of project work, student-directed learning, workshops, collaborative problem-solving sessions and online activities, which are assessed by means of written assignments, project reports and a dissertation. There will be a strong emphasis on enhancing the learner experience through case studies and project work. The applied nature of several of the courses, will require students to deal with real case scenarios and apply the concepts explored in the first semester courses in later parts of the program. In addition, during the dissertation/project phase, students will be encouraged to develop projects of relevance to organisations and where there are practical outcomes/impacts.

e) Modes of study

Initially the programme will be offered full-time, on-campus only. We may consider part-time and distance modes after the initial set-up period.

f) Exit awards available at the completion of specific stages of the programme

Depending on the attainment of the students over the course of study, the possible exit awards include the Postgraduate Certificate (PGCert), the Postgraduate Diploma (PGDip) and the Master of Science (MSc). Specifically for the MSc award, there are three possible classifications: Pass, Merit and Distinction. The conditions for each of these exit awards are listed below.

- In order to be awarded the PGCert students must:

- (a) pass at least 40 credits with a mark of at least 40%; and
- (b) attain an average of at least 40% for the 60 credits of study examined for the certificate.

- In order to be awarded the PGDip students must:

- (a) pass at least 80 credits with a mark of at least 40%; and
- (b) attain an average of at least 40% for the 120 credits of study examined for the diploma.

- In order to be awarded a Master students must:

- (a) have satisfied any requirements for progression, as laid out in Section c.
- (b) attain an additional 60 credits, by achieving a mark of at least 50% for the dissertation component.

When all the marks for the taught components of the programme or diploma are available, and the student has achieved PASS marks in at least 80 credits and has an overall average of 40% or more over the full 120 credits, then they will be awarded credits on aggregate for the failed courses, up to a maximum of 40 credits. For a certificate, a maximum of 20 credits may be awarded on aggregate.

Award of postgraduate merit

To achieve a merit, a student must be awarded at least 60% on the University's Postgraduate Common Marking Scheme for the dissertation, and they must pass all other courses with an average of at least 60%.

Borderlines, for both the dissertation and course average elements, are considered for merits.

Award of postgraduate distinction

To achieve a distinction, a student must be awarded at least 70% on the University's Postgraduate Common Marking Scheme for the dissertation, and they must pass all other courses with an average of at least 70%.

Borderlines, for both the dissertation and course average elements, are considered for distinction.

MSc (Pass)

In all other cases, students eligible for the MSc degree graduate with a PASS classification.

g) Social responsibility

The programme has content on the ethical issues of Financial Technologies and their responsible development and deployment including the assessment of the social and political landscape.

h) Equality and diversity.

The programme will provide a learning environment which promotes equal opportunities regardless of race, national or ethnic origin, disability, age, gender, sexual orientation, transgender identity or religion/belief. The School of Informatics holds an Athena SWAN silver award in recognition of its efforts in supporting women students and staff. As part of this process we monitor student intake by gender and actively seek ways to increase the number of applications from women. The School strongly supports our “Hoppers” groups for women in Informatics.

TEACHING AND LEARNING METHODS AND STRATEGIES

a) The range of teaching and learning methods used on the programme, by year of programme (including opportunities for feedback)

Teaching and learning methods include traditional lecture-style teaching, interactive sessions (tutorials and seminars), group practical work (labs, supervised practical sessions, coursework) and supervised, self-directed study (private study, preparation of literature reviews, research proposals, dissertation preparation). Coursework is submitted periodically throughout the semesters. Exams normally occur at the end of the semester in which the course is taught. All the courses will include formative feedback opportunities. Students will have access to School of Informatics computer laboratories and will have opportunities further to develop their computing skills in a range of practical work. We will make use of the LEARN VLE to manage course content and coordinate course resources. The Piazza Forum and tools like TopHat will enhance discussion and build community. Media Hopper will be used for lecture capture to support review and revision.

b) Facilities (e.g. library; IT or any other distinctive facilities provided within the School)

The programme will be embedded within high-class facilities School of Informatics and the Business School, including laboratories and IT facilities.

TEACHING AND LEARNING WORKLOAD

Start Year	Time in scheduled teaching (%)	Time in independent study (%)	Time on placement (%)
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Semester 1 (55 -65 credits, due to business school's 15 credits courses)	20%	80%	0
Semester 2 (55 -65 credits depending on S1 and totally 120 credits in S1 and S2)	20%	80%	0
Semester 3 (60 credits of dissertation)	10%	90%	0

Please see the attached workload analysis table for detail

ASSESSMENT METHODS AND STRATEGIES

The programme will use a mixture of coursework and examination with the inclusion of formative assessment opportunities to provide actionable feedback. Coursework proportions vary from 20% to 100%. Coursework will range from: practical exercises where students are required to develop and implement a computer program that solves a particular problem; the use of computer-based tools to solve a problem (e.g. in Machine Learning courses); more mathematical exercises in problem solving; essay writing; and the creation of more structured texts such as a project proposal. The particular choice is matched to the learning outcomes for the course.

ASSESSMENT METHOD BALANCE

Please indicate the typical assessment methods for a student on this programme for each year of study. Additionally please complete the Assessment matrix.

Start Year	Assessment by written exams (%)	Assessment by practical exams (%)	Assessment by coursework (%)
Semester 1 (55 -65 credits, due to business school's 15 credits courses)	70%	0%	30%
Semester 2 (55 -65 credits depending on S1 and totally 120 credits in S1 and S2)	70%	0%	30%
Semester 3 (dissertation)			100%

CAREER OPPORTUNITIES

Regarding our graduates' career destination, the programme students will be equipped with strong technology knowledge and widely in demand by top finance, bank, insurance IT firms, infrastructure service firms, government organizations. Moreover, there is a widespread and growing interest in almost every industry for improving the digitalisation of their information systems.

The graduates will have the **strong technology** background to keep up with developments in computing technologies, both in research and engineering. Typical areas to pursue a career include: Quant Developer, Financial System Architect, Application Engineer, Financial System Consultant, Software Developer, Data Driven Technology

Researcher (in academia or industry), as well as financial system officers of various kinds in banks, insurers, funds, asset management business sectors, government and public sector positions.

OTHER ITEMS

ABOUT THE PROGRAMME

ADDITIONAL REQUIREMENTS

PRSB Accreditations (where relevant)

None

Admissions requirements

Before completing this section please contact a member of the Recruitment and Admissions team for further guidance.

A UK 2:1 honours degree, or its international equivalent, in informatics, artificial intelligence, cognitive science, computer science, electrical engineering, linguistics, mathematics, physics, or other numerate degree.

Competent programming skills are essential. During your degree you must have completed a programming course in at least one of the following: C/C++, Java, Python, R, Matlab, Haskell, ML.

During your degree you must have completed the equivalent to 60 credits of mathematics that have typically covered the following subjects/topics: calculus (differentiation and integration), linear algebra (vectors and multi-dimensional matrices), discrete mathematics and mathematical reasoning (e.g. induction and reasoning, graph theoretic models, proofs), and probability (concepts in discrete and continuous probabilities, Markov chains etc.)

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You must demonstrate a level of English language competency at a level that will enable you to succeed in your studies, regardless of your nationality or country of residence.

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We accept the following English language qualifications at the grades specified:

	<p>IELTS Academic: total 6.5 with at least 6.0 in each component</p> <p>TOEFL-iBT: total 92 with at least 20 in each section</p> <p>PTE Academic: total 61 with at least 56 in each of the Communicative Skills scores</p> <p>CAE and CPE: total 176 with at least 169 in each paper</p> <p>Trinity ISE: ISE II with distinctions in all four components</p> <p>Your English language qualification must be no more than three and a half years old from the start date of the programme you are applying to study, unless you are using IELTS, TOEFL, PTE Academic or Trinity ISE, in which case it must be no more than two years old.</p>
To be completed by R & A Team	<p><i>Please select to confirm that a member of the R & A section have consulted on the Admissions requirements.</i></p> <p><input type="checkbox"/></p>
Work experience/work based learning opportunities	Not included in the formal curriculum.

CONSULTATION	
Student body	<p>Since the stage 1 development of this proposal, the programme team has consulted with a wide range of relevant bodies within UoE. The consultation includes the following stream of relevant bodies:</p> <p>Informatics senior management members: we have consulted with head, deputy heads of informatics, director of teaching/research/graduate school and several head of institutes. All of these senior members are supporting and seeing the needs of such collaborative new MSc. The main concern is about already overloaded informatics existing courses (e.g. data science) and concerning the availability of business school's courses.</p> <p>Action: the programme team has consulted with director of teaching, course leaders and head of the school to make sure that Informatics heavy loaded courses are not included in this programme's curriculum. In addition, we planned double teaching for IAML to off load the new students onto the new S2 IAML course. In addition, the programme team has several meetings with senior management members of the Business School (including Director of PG, head of groups for relevant business school courses). The Business School's Director of PG has confirmed the availability of the business school courses included in our new MSc's</p>

curriculum and will prepare for a confirmation letter for the Head of Business School to sign (Head of Informatics does aware this action as well).

Informatics student administration and college recruitment team: the programme team has consulted with Informatics student admin team and college recruitment team about this new MSc. The admin team highlight the importance of being able to have the new MSc in the Informatics brochure and Website.

Action: The programme team has already worked with the brochure production team together with relevant colleagues and this programme has already been in the 20-21 brochure and setup a web page for the new programme. The new MSc is waiting for BoS/College approval to formally start the marketing/recruitment. In addition, the recruitment team suggested a clear criteria for entry requirements. The programme team has made this explicitly clear in the Stage 2 approval document.

Informatics course leaders and project supervisors: the informatics programme team has discussed with a number of course leaders and MSc project supervisors about the new MSc and potential concerns from course leaders. Most course leaders expressed three potential issues: (i) Sufficient CS/Computing/Math background; (ii) Workload and capacity for courses; (iii) Availability of suitable dissertation supervisors.

Action: the programme team has updated the entry criteria of the MSc and explicitly highlighted entry criteria for CS/Engineering/Math UG graduates; the programme leader also planned an induction workshop for the new MSc students to advise them to choose suitable optional courses to avoid issues at the beginning of students' MSc study. The curriculum also tried to avoid include oversubscribed informatics/business/math courses to make sure that there are sufficient capacity for the relevant courses. Also the aim of recruiting 20 students have been discussed with a number of courses, which might have capacity concerns, and so far no capacity issue is raised for compulsory courses of this new MSc. For the dissertation supervision, we have identified a number of Informatics supervisors who may have relevant background/expertise. The programme leader has also discussed with the head of school as well as the director of teaching, regarding relieving some of the supervisors with UG dissertation duties to supervise students of this MSc (e.g. the programme leader and newly appointed lecturer). The programme team has also identified a number of Business/Math School colleagues, who may be interested in supervising Informatics students. In addition, the programme leader has discussions with Informatics Business collaboration managers as well as several industry partners who may be interested in co-supervising students.

Informatics students, IT support and other relevant bodies: the programme team has also informally discussed with a number of Informatics UG students about this new MSc and some of those students showed great interests in doing such an interdisciplinary MSc. The programme team also aware the IT /lab/teaching needs. In generally, standard Informatics teaching support applies to this MSc. The programme team will

work together with the course leaders and School's senior management (e.g. head of school and director of teaching) to ensure the availability of essential teaching facility. In addition, the programme team has discussed with UoE library about several data sources which currently available for UoE students. The programme team has identified a rich number of datasets which can be used by students for their coursework and dissertation projects.

Business School: since the stage 1 and first stage 2 meeting, the programme team has taken Informatics BoS's advice on having minimum 30 credits from the Business School. The programme team has conducted a number of meetings with the Head of Information System Group, Head of Finance Group, Head of Management Science Group, Director of PG studies, Individual course leaders, the programme leader of MSc in FTP programme, timetabling admin and the marketing/recruitment team within the Business School etc. Overall, the business school supports this collaborative MSc programme. However, the Business School had expressed a number of challenges and issues. First, Business School has a maximum of 60 students per course, which will represent capacity challenge. Second, the programme leader of the FTP programme expressed a concern of partial overlapping with MSc in FTP programme with our new MSc. Third, marketing recruitment team also expressed concern of overlap ped student markets/recruitment. Forth, Business school has 15 credits course, which needs to be aware of.

Action: To manage capacity issue, the programme team has meetings with head of groups, PG director and course leaders within the Business School. The current 3 Business School courses are identified as suitable courses, which are not suffer from capacity issue with targeted student numbers for this MSc. Also the programme team will keep communicate with the business school senior management team if there is any capacity raised in the future, so that Informatics will also manage student numbers or introduce alternative optional courses. To address the concern raised by the programme leader of MSc in FTP, the programme team, removed all Business/Informatics courses overlapped with MSc in FTP except IAML S2, which is designed for this MSc programme. The programme team has also updated the recruitment criteria and only consider applications with strong computing/engineering/math background. This would avoid recruitment market overlap. To cope with 15 credits issue with Business School courses, the new MSc is designed to allow students to choose 30 credits.

Mathematics School: the programme team has extensive discussion with the Head of Math School, leaders quantitative finance related programmes and related course leaders. Math has agreed to provide two optional courses as listed in the new MSc. This would allow our new programme students to have a wider range of interdisciplinary choices of courses with enhanced quantitative learning experience.

	<p>Bayes/EFI: The programme team has discussed with the director, industry liaison director, education director of Bayes. Bayes highly appraises this new programme and would happy to provide support for the development and industry liaison of this new MSc once it starts running. The programme team has discussed this new MSc with previous and current EFI directors and support staffs from time to time, EFI encourages the Univ-wide education portfolio development in general. The EFI director also highlighted that we shall avoid duplicated effort with the Business School's MSc. The programme team has addressed this comment through reducing overlapped courses and clearly differentiate the recruitment market with emphasising informatics entry criteria.</p>
<p>External Review/Critical Friend</p>	<p><i>In addition to the consultation process at Stage 1 please provide a full summary of the consultation undertaken and the impact this has had on the development of the programme</i></p> <p>Since the stage 1 development of this proposal, the programme team has consulted with a wide range of relevant external bodies as collaborators of UoE as follows:</p> <p>DDI/Fintech Scotland/Scottish Enterprise/Scottish Development International: all of these Edinburgh related organizations highlight appraised this new MSc and commented that Scotland has strong booming demand for having such cutting-edge technology and application focused PG education programme.</p> <p>Existing and potential Industry collaborators in UK and Internationally: the programme team has extensive discussions with Informatics existing industry partners as well as potential collaborators, Informatics visitors of Bayes/Informatics. They all agree that industry would have strong demands for such a technology focused PG education programme and need to recruit fresh talent in related areas. Financial services is UK's flagship industry with London/Edinburgh as the largest finance centres. Particularly, Informatics is traditionally strong in theoretical aspects Data Science, AI, Computing and Foundations of CS. While industry would like to take well educated students with application specific skills as well. This programme will support fulfil such theory to application gap.</p> <p>Colleagues from other UK universities and research institute: the programme team has also informal discussions with other universities (e.g. Imperial College) and research institutes (e.g. Turing Institute). In general, these collaborators are supportive. While as an external examiner of Imperial College's MSc programme in related field, the programme leader also aware some challenges related to run such a programme. E.g. Imperial college's related programme has particularly high demand, which pressurised the</p>

	<p>staff workload challenge. It is in a similar situation for Southampton. In addition, there is a strong demand for industry liaison effort/project, which the programme team also tried to plan for this with Informatics Business collaboration managers. Furthermore, due to high number of students and percentage of coursework, IC has lack of enough staff members to keep updating coursework/exam papers which results relatively high marks. While the programme team has looked through the courses in our MSc and tried to ensure that coursework/exam are well balanced (70% exam, 30% coursework in average).</p>
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ADDITIONAL DOCUMENTS	
Memorandum of Agreement (if applicable)	Not needed
Award letter (if applicable)	Not applicable
DPT (please use your current template)	Attached with the programme curriculum
APPROVAL	

Programme Title:	Advanced Technology for Financial Computing
Programme Proposer:	Tiejun Ma and Valerio Restocchi, Stuart Anderson, Neil Pollock,

STAGE 1: SCHOOL BOARD OF STUDIES REVIEW AND APPROVAL

Confirmation of approval of the proposal at the School Board of Studies should be entered below.

Date of BoS: 13/03/2019
Convener Name:
Comment and Approval (BoS Minute):

STAGE 2: HEAD OF SCHOOL REVIEW AND APPROVAL

Head of School: Jane Hillston
Comment and Approval:
Signature:

STAGE 3: COLLEGE CURRICULUM APPROVAL BOARD REVIEW AND OUTCOME

DOCUMENT CHECKLIST	
Document	Completed
DPT	<input type="checkbox"/>
Memorandum of Agreement (if applicable)	<input type="checkbox"/>

Assessment Matrix	<input type="checkbox"/>
Award letter (if applicable)	<input type="checkbox"/>