



Proposal for New Degree Programme

Stage 1

Contents

1 OVERVIEW OF PROGRAMME

ABOUT THE PROGRAMME

2 BUSINESS CASE

STRATEGIC PLANNING, RECRUITMENT & COMPETITOR ANALYSIS

FEES AND COSTING

ANTICIPATED AND PROJECTED ENROLMENTS

PLANNING AND RESOURCES

COLLABORATIVE PROGRAMMES

3 CONSULTATION AND APPROVAL

STAGE 1: CONSULTATION

STAGE 2: SCHOOL BOARD OF STUDIES REVIEW AND APPROVAL

STAGE 3: HEAD OF SCHOOL REVIEW AND APPROVAL

STAGE 4: COLLEGE CURRICULUM APPROVAL BOARD REVIEW AND OUTCOME

OVERVIEW OF PROGRAMME

Grey text has been added to provide guidance. Please delete as you add your own text, remove italics, and change the font colour to black.

ABOUT THE PROGRAMME		
Title of programme	Advanced Technology for Financial Computing	
Intended Award	MSc	
Alternative awards	Possible exit awards include the Postgraduate Certificate (PGCert), and the Postgraduate Diploma (PGDip)	
School	School of Informatics	
Programme Director	Tiejun Ma	
Programme start dates	2020-2021	
SCQF level of highest award	11	
Total credit value of programme (<i>for highest award</i>)	180	
Partner institution(s) if any	Business School and Math School	
Mode of delivery (Please ✓ those which apply to this programme)	On campus	Y
	Online	N
	Blended learning	N
	FT	Y
	PT	N
	Intermittent	N
Expected length of programme	FT	12 months
	PT	N
	Intermittent	N
Description of the programme and its structure (maximum 150 words)		

The MSc in Advanced Technology for Financial Computing is a cross-disciplinary qualification targeted at high-potential employees working in complex, innovative-intensive, technology-driven organisations. The programme is based on full-time study and has strong links to existing centres of research excellence within two world-class academic Schools- School of Informatics and Edinburgh Business School.

The MSc in Advanced Technology for Financial Computing is a response to the growing need for highly specialised training in the area of technologies for digital finance. Training at the postgraduate level can be an extremely effective catalyst given the lack of systematised technology and engineering practices in information technology and the rapidly evolving nature of digital financial services. The programme will aim to create a generation of leaders in technology and finance related sectors (both in academia and industry).

The School of Informatics conducts research on wide aspects of the core technology and applications related to artificial intelligence, data science, machine learning, natural language processing, cyber security, network systems and foundations of computer science. While the Business School conducts research related to digital finance, information systems, business analytics, decision science, operations research etc. Both schools provide solid research and teaching environments to support the facilitation of this proposed new MSc. The proposed specialism courses cover topics: blockchain, machine learning, high frequency trading, financial engineering, text technology, risk management in banks, optimisation, statistical programming etc. The teaching team of the new MSc is lined up with world class researchers and educators from both School of Informatics and the Business School

The curriculum is designed in such a way, that each student will receive a tailor-made training regime with a number of optional modules that is suitable for students' focal area within related to financial technology, but will also develop a joint perspective from the business aspect as well as the informatics aspects.

Career, employability and opportunities for continuing professional development.

Regarding our graduates' career destination, the programme students will be widely in demand by top finance, IT firms, infrastructure service firms, government organizations. Moreover there is a widespread and growing interest in almost every industry for improving the technology practice related to finance sectors. It is anticipated that a good number of students on the programme will be sponsored by their employers as continuing professional development.

Through the programme training, the graduates will have the necessary background to keep up with advance technologies and knowledge related to finance, both in research and engineering. Typical areas to pursue a career include: trading firm developer, software architect, financial system engineers, financial risk analyst, business consultant, financial auditor, fintech researcher (in academia or industry), as well as managers of various kinds in government and public sector positions in relation to the financial systems. These are highlight demanded positions in multiple sectors including banks, investments, trading, IT firms, start-ups, insurance company's consultancy firms, etc. There are well established career development paths and certification schemes including well established Chartered Financial Analyst (CFA). There is major a booming demand in the industry to hire graduates with strong technology background and have finance related knowledge.


BUSINESS CASE

This section should be used to outline the business case for the proposed programme. Before completing this section market research should have been undertaken.

STRATEGIC PLANNING, RECRUITMENT & COMPETITOR ANALYSIS	
Programme Title	MSc in Advanced Technology for Financial Computing
Programme Proposer	Stuart Anderson, Neil Pollock, Tiejun Ma and Valerio Restocchi
Strategic Planning	<p>Our proposed new MSc is part of Informatics and Business School's collaboration plan as a growth area for a number of years. The MSc is part of a wider initiative across the University to establish a network of researchers and forms a stage in connecting relevant courses across multiple disciplines. It fits with the University's Data Driven Innovation strategy and its Fintech strand, which we expect must evolve to encompass research more broadly on advanced technologies (e.g. AI, Data Science) for future digitalised financial services. The University has been exploring opportunities with a number of strategic partnerships, financial technology is one of the demand areas which is scheduled for future development. While Informatics is leading on MSc in Advanced Technology for Financial Computing, the Business School also planned a new MSc in Technology Management and Digital Future. Both Schools have strong willingness and strategically plan to work together on the Business and Informatics postgraduate education strand.</p>
<p>Recruitment</p> <p><i>Please provide a detailed commentary on your marketing and recruitment strategy.</i></p>	<p>We would expect standard Informatics MSc admission criteria (e.g. A UK 2:1 honours degree, or its international equivalent, in informatics, artificial intelligence, computer science, electrical engineering, , mathematics, business graduates with good programming, quantitative background, physics or psychology.) applies to this new MSc as we are mainly targeting CS graduates and related disciplines with reasonable quantitative background.</p> <p>There is a strong push from central government for research and teaching in financial technologies, as part of the national UK AI and Data Science Innovation Strategy. This is because there is a dire need for highly qualified personnel and finance sector is UK's flagship sector with world-wide reputation. London is a world top finance centre and leading on technology innovation. Edinburgh is UK's second largest city, which hosts financial services with booming technology firms and start-ups. The industry is facing a serious shortage in the area and graduates with technology expertise and finance related knowledges are in high demands.</p> <p>Within an increasingly competitive global employment context, however, graduates that tend to be most successful are those who can demonstrate an ability to combine technical skills with business skills. These include graduates who display deep technical skills with an understanding of the broader management and business issues surrounding information technologies that are required for effective problem-solving in an advanced IT context; and those who display deep business skills while at the same time demonstrating a solid if broader understanding of technology. The programme targets students that aim at becoming professionals or researchers in fintech related space. Top graduates of the programme will follow careers leading to high-profile positions such as Chief Technology Officer (leader of all technology initiatives in a company), Technology Consultants (design the best possible fintech solutions), System Architects (desig, build,</p>

	<p>and oversee the implementation of network and financial systems for IT or finance companies) etc. They will also be ideally placed to become researchers in the area of fintech both in academia and industry.</p> <p>There are a number of marketing channels that Informatics and the Business School for recruiting the MSc students. Also our undergraduate students have had prominent recent successes increase our visibility towards prospective students interested in advanced technologies related to digital finance, but also towards industry and public sector organisations. This can in turn open funding and employment opportunities for our students.</p> <p>This programme should not directly impact any other of our programmes. This is a specialised MSc programme that does not overlap a lot with the other specialised MSc programmes such as the MSc in Data Science, MSc in Cognitive Science or MSc in Artificial Intelligence in their core courses. There might be cases, where students wanted to gain knowledges cross AI, Data Science and Business/Finance related subjects, our newly proposed programme would be an ideal choice for such students and relief Informatics overwhelming demands on MSc in AI and MSc in Data Science.</p>																		
<p>Competitor Analysis</p> <p><i>A competitor analysis report provides a better understanding of the marketplace and competition, from the going rate for tuition fees to the unique selling points and marketing strategies of competitor programmes.</i></p>	<p>The main competitors listed below, Financial Computing MSc’s offered by either other UK top Universities financial computing groups within their computer science departments such as UCL, Imperial College, University of Warwick, Queen Mary University of London, University of Stirling.</p> <p>Our proposed MSc covers a wide range of topics, ranging from data mining to text technologies, high frequency trading and financial engineering. Informatics has world-class AI and data science groups, renowned researchers in foundations of computer science including cyber security. Informatics made new hires of two new academic to facilitate the Business and Informatics strand collaboration with the Edinburgh Business School. This strengthens our course by offering the opportunity to students to be taught a wide range of topics from leading experts in each particular area. Moreover, we offer a number of highly specialised courses, such as “Blockchains and Distributed Ledgers”, “high-frequency trading” and “machine learning” that are likely to attract ambitious students and distinguish us from our competitors. Within local competition in Scotland, other Scottish MSc in Financial Technology (e.g. Stirling) offer different courses with main focus on applied aspects, lacking the strong technical aspects we offer with Informatics and Business School’s world-class teaching/research academic support.</p>																		
<p>Competitor Fees</p> <p><i>Provide the fee structure (in British pounds) of three competitors, preferably those mentioned in the competitor analysis. These may be UK or International competitors.</i></p>	<table border="1"> <thead> <tr> <th data-bbox="584 1123 1048 1193">Institution</th> <th data-bbox="1055 1123 1444 1193">Programme</th> <th colspan="2" data-bbox="1451 1123 2098 1193">Fees</th> </tr> <tr> <td colspan="2"></td> <th data-bbox="1451 1193 1787 1264">Home</th> <th data-bbox="1794 1193 2098 1264">International</th> </tr> </thead> <tbody> <tr> <td data-bbox="584 1268 1048 1342"></td> <td data-bbox="1055 1268 1444 1342"></td> <td data-bbox="1451 1268 1787 1342"></td> <td data-bbox="1794 1268 2098 1342"></td> </tr> <tr> <td data-bbox="584 1347 1048 1420">University College London (UCL)</td> <td data-bbox="1055 1347 1444 1420">MSc in MSc Financial Systems Engineering (website)</td> <td data-bbox="1451 1347 1787 1420">£12,380</td> <td data-bbox="1794 1347 2098 1420">£26,670</td> </tr> </tbody> </table>	Institution	Programme	Fees				Home	International					University College London (UCL)	MSc in MSc Financial Systems Engineering (website)	£12,380	£26,670		
Institution	Programme	Fees																	
		Home	International																
University College London (UCL)	MSc in MSc Financial Systems Engineering (website)	£12,380	£26,670																

	Imperial College	MSc in Computing -Management and Finance (website) MSc in Financial Technology (website)	£ 9,250	£ 30,250
	QMUL	MSc in Financial Computing (website)	£19,300	£19,300
	University of Stirling	MSc in Financial Technology (website)	£6,500	£15,950
	University of Reading	MSc in Financial Technology (website)	£16,500	£23,750

FEES AND COSTING		
Programme fees <i>Fees are expressed per academic year in British pounds. For PGT programmes, a Programme Costing Template will also be required for Fee Strategy Group.</i>	Home-Scotland / EU	£14,600
	Home-RUK	£14,600
	Overseas	£32,500
Fees for each new PGT programme are sent by College to the Fee Strategy Group (FSG) for review and approval. The FSG has developed a Programme Costing Template to give FSG insight into the anticipated profitability of a programme and where it sits within its market. The Fees Costings template, and guidance from FSG on filling out the template is included in the spreadsheet attached to the right (initial cost estimation draft).		
Additional Programme Costs (PGR only)		
<i>Additional costs to the student should be noted and justified in the table below. These should consist of items that are over and above the basic provision that should be available to all students and should reflect the special additional costs associated with the specific programme of study. Individual items over £200 should be noted on a separate row.</i>		
Item	Cost	% of Total
<i>Add rows as necessary</i>		

Total:		100%

ANTICIPATED AND PROJECTED ENROLMENTS			
<i>What are the anticipated and projected enrolments over the next three years?</i>			
	Year 1	Year 2	Year 3
Home	5	10	10
International	15	20	20
Supporting Research What market research has been planned or completed to support the predicted student numbers?	<p>These numbers are based on an estimation based on competitor University's student numbers as well as our estimated projection colleagues' input. Those numbers are also likely under-estimates due to booking demands in financial technology related education market.</p> <p>The school has a history of attracting students onto specialized MSc degrees such as the Masters in Design Informatics and the Masters in Artificial Intelligence, both of which regularly reach numbers similar or larger than the ones above. Within the MSc in Data Science, there are increasing number of students who wanted to study financial technology related subjects as well as proceed with financial technology related dissertation projects.</p> <p>It is anticipated that this MSc is a cross-area problem impacting a number of aspects of Computer Science and well Business related study subjects and as a result, a good number of academic staff within both schools work on it directly or indirectly. The most likely cause of sustainability issues for the program would be if we no longer have enough staff to teach and support the courses or take on project students but with Informatics and Business School's new academic hiring, such risk is low.</p>		

PLANNING AND RESOURCES	
New Courses	<p>1 new specialist course will be introduced to complement the courses we already teach:</p> <ul style="list-style-type: none"> • Data-Driving Business and Behaviour Analytics <p>The module is designed to bridge the knowledge gap between Informatics and Business disciplines. It will provide students opportunities to use informatics technology, mathematical modelling techniques to study real-world business challenges. The initial course proposal is</p>

	<p>submitted together with this programme proposal to the Board of Studies (BoS). The full course proposal will be brought to the BoS for approval in the stage 2 of this programme proposal. See attached outlines of the course proposal.</p> <p>In addition, enrolled MSc students will attend informatics ethic related research seminars and non-credit bearing workshop to cover ethic related training topics.</p>
Facilities and Equipment	<p>The programme does not have extra estates requirements or equipment requirements and will be relying on existing teaching and learning facilities within both Business School as well as Informatics for enhancing the students' experience, in particular during their summer projects.</p>
Staff	<p>Except the 1 new module proposed in this programme (will be taught by the newly hired Business Applications for Informatics Lecturer), the proposed specialist courses are already being resourced by the School of Informatics and School of Business. With the newly recruited 2 academic staff who will responsible to run the new programme and teach the new module. So there is adequate teaching staff to resource the programme, maintain the curriculum. The Business School also have liaison academics (e.g. Prof. Neil Pollock), who will support the Business and Informatics collaboration. The risk of not having adequate teaching staff for the core courses of the programme is relatively low.</p> <p>Regarding the staff for dissertation supervision, we will mainly rely on Informatics supervision capacity (e.g. several Business and Informatics academics to cover this MSc related area), while we welcome Business/Math supervisors (dissertation supervision payment scheme would need to be discussed) but within targeted 20 students to start with, we could cope with Informatics supervision capacity and may not rely on other schools to ensure a smooth student supervision experience.</p>
Resource Sharing	<p>Given the scope of the proposed programme, the proposed DPT includes courses from the School of Business and School of Mathematics. We have consulted with colleague academics from both Business School and Mathematics and they welcome such collaboration. We will further our consultation with module leaders included in the DPT, and make sure that we will be able to run the new programme smoothly while have shared resources.</p> <p>Some of the courses having restricted capacity, we will need to devise rules for prioritising students registration. This aspect has not yet been finalised and will be discussed further. Such rules need to be devised carefully and require approval of the corresponding Board of Studies.</p>

COLLABORATIVE PROGRAMMES

Additional information is required for new programmes that are collaborations with external institutions or organisations which will result in a joint award and/or where taught components are shared. International partnerships must have a Memorandum of Understanding (MoU) in place before the programme can be approved by College.

Should the proposal be progressed to Stage 2 a draft Memorandum of Agreement (MoA) will need to accompany the submission.

Separate guidance is available for the development of collaborative programmes.

<http://www.ed.ac.uk/governance-strategic-planning/collaborative-activity/guidance-templates>

No External Collaboration

- *Please provide brief details of partnership below, including confirmation of which institution will be the Administering University, the fee structure and confirmation of any external funding (if available).*

CONSULTATION AND APPROVAL

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

STAGE 1: CONSULTATION

Please confirm consultation with relevant stakeholders has taken place.

Stakeholder	Yes	NA
School Director of Professional Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>
School Academic Administration Staff	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Information Services (including Academic Support Librarians)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Student Body (SSLC/Student representatives)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Partner School Staff (E.G. Joint Programmes/shared courses etc)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Employers	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Industry and Professional Bodies	<input checked="" type="checkbox"/>	<input type="checkbox"/>
External Consultation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Please note any other consultation		

Please provide a brief comment on the consultation process

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.

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 and they are supportive in having this new MSc.

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. Informatics colleagues are supportive in general.

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.

Business School: The programme team has conducted a number of meetings with the Head of Information System Group, Head of Management Science Group, Director of PG studies, Individual course leaders and the marketing/recruitment team within the Business School etc. Overall, the business school supports this collaborative MSc programme.

Mathematics School: the programme team has extensive discussion with the Head of Math School, leaders quantitative finance related programmes and related course leaders. Math colleagues are supportive in general.

Please provide a brief comment on the consultation process with External consultants

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.

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.

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.

STAGE 2: 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:
Convener Name:
Comment and Approval (BoS Minute): <i>Please provide either a link to the minutes of the Board or a copy of the relevant text from the minutes.</i>

STAGE 3: HEAD OF SCHOOL REVIEW AND APPROVAL

Head of School: <i>Please print name</i>
Comment and Approval:
Signature:

STAGE 4: COLLEGE CURRICULUM APPROVAL BOARD REVIEW AND OUTCOME

Date of CCAB:
Convener Name:

Stage 1 Outcome (please select as appropriate)	
Permission to proceed to Stage 2	<input type="checkbox"/>
Permission to proceed to Stage 2 with conditions	<input type="checkbox"/>
Proposal rejected with recommendations	<input type="checkbox"/>
Proposal rejected	<input type="checkbox"/>
Comment:	

Document Control

Date approved: Start date:	Amendments:	Date for next review:
Contact name & role:	Department:	Email:

Matt Elliot	College Academic Affairs	Matt.Elliot@ed.ac.uk
If you require this document in an alternative format please email: deanqa@exseed.ed.ac.uk		