



Proposal for New Degree Programmes

Stage 2

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THE UNIVERSITY OF EDINBURGH

PROGRAMME SPECIFICATION FOR [*INSERT NAME OF PROGRAMME OF STUDY, e.g. M.A. Honours in Ancient History or M.Sc. in Public Health*]¹

PROGRAMME SPECIFICATION

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.

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

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	
Relevant QAA Subject Benchmarking Group(s)	Computing
Postholder with overall responsibility for QA	Stuart Anderson Tiejun Ma and Valerio Restocchi
Date of Production/revision	May 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 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. • 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

- 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

For formal definitions, including details of compulsory and optional course choices, consult the University Degree Programme Table. The list of Informatics courses links courses to subject area.

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 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 research group. The research 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.

Case studies and projects: There will be a strong emphasis on enhancing the learner experience through 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.

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. Successful completion of the programme leads to the award of master degree at pass, merit or distinction level. The University's regulations in respect of a standalone Master programme applies.

Students need to achieve an average from the combined exam and coursework results of at least 50% to proceed to the dissertation phase. Those with an average of at least 40% exit with a Diploma and those below 40% Fail.

TEACHING AND LEARNING METHODS AND STRATEGIES

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 on the coursework normally occur at the end of semesters 1 and 2.

Full time only. A candidate whose work is judged to be satisfactory may be permitted to pursue his/her dissertation project work at their sponsoring company during his/her third year, subject to satisfactory supervision arrangements being made.

TEACHING AND LEARNING WORKLOAD

Start Year	Time in scheduled teaching (%)	Time in independent study (%)	Time on placement (%)
Year 1	49	51	0
			<i>Add rows as necessary</i>


ASSESSMENT METHODS AND STRATEGIES

Coursework is submitted periodically throughout the semesters. Exams on the coursework normally occur at the end of semesters 1 and 2. Students need to achieve an average from the combined exam and coursework results of at least 50% to proceed to the dissertation phase. Those with an average of at least 40% exit with a Diploma and those below 40% Fail.

There are three possible degree classifications:

- MSc with Distinction requires an average of at least 70% across all taught courses and a dissertation mark of at least 70%;
- MSc: average of at least 50% across all taught courses and a dissertation mark of at least 50%
- Diploma: average of at least 40% across all taught courses.

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 (%)
Year 1			
			<i>Add rows as necessary</i>

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)

Please note accreditations awarded or planned

Admissions requirements

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

Computer Science entry criteria applies to this new MSc programme. Applicants are normally expected to have quantitative background, achieved a first-class or strong upper second-class undergraduate degree with honours (or equivalent international qualifications), as a minimum, in a related subject, such as computer science, informatics, engineering, mathematics, or physics. Applicants whose first language is not English are usually required to provide evidence of proficiency in English at the higher level required by the University.

To be completed by R & A Team

Please select to confirm that a member of the R & A section have consulted on the Admissions requirements.

Work experience/work based learning opportunities	<i>Details of organised work experience / work based learning opportunities available during the programme (if applicable)</i>
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CONSULTATION	
Student body	<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>
External Review/Critical Friend	<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>

ADDITIONAL DOCUMENTS	
Memorandum of Agreement (if applicable)	
Award letter (if applicable)	
DPT (please use your current template)	Attached with the programme curriculum
APPROVAL	

Programme Title:	Business Informatics - Advanced Technology for Financial Computing
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Programme Proposer:	Tiejun Ma and Valerio Restocchi, Stuart Anderson, Neil Pollock,
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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"/>