THE UNIVERSITY OF MANCHESTER
Postgraduate Programme Specification

1. GENERAL INFORMATION

Award	Programme Title	Duration	Mode of study
MSc	Quantitative Finance	1 Year	Full Time
PgD	Quantitative Finance (exit award only)	9 months	Full Time
PgC	Quantitative Finance (exit award only)	6 months	Full Time

School	Alliance Manchester Business School School of Mathematics and Statistics
Faculty	Humanities Engineering and Physical Sciences
Awarding Institution	University of Manchester
Programme Accreditation	n/a
Relevant QAA benchmark(s)	There are no benchmark statements at postgraduate level for this subject area. The programme conforms to the Framework for Higher Education Qualifications.

2. AIMS OF THE PROGRAMME(S)

The programme aims to:

1.	Develop the specialised quantitative skills required (including material from stochastic calculus, probability theory, linear algebra, and analytic optimisation) to implement theories related to quantitative finance.
2.	Develop students' powers of inquiry, critical analysis and logical thinking and apply theoretical knowledge to current issues of policy and practice in the field of quantitative finance.
3.	Provide training in numerical methods and statistics and provide a thorough grounding in pricing and risk management techniques.
4.	Prepare graduates for career paths in financial institutions that require advanced technical skills in quantitative analysis, financial research, quantitative asset management, derivatives structuring, financial programming, quantitative strategies implementation and risk management.
5.	Provide many of the tools required to undertake high quality research in academic and financial institutions [MSc only].

3. INTENDED LEARNING OUTCOMES OF THE PROGRAMME(S)

A. Knowledge & Understanding

Students will have:

A1.	A comprehensive understanding of asset pricing and investment finance principles, together with underlying theories of security markets; a comprehensive understanding of risk measures and the associated statistical tools for risk management.
A2.	An advanced knowledge of areas in mathematics and statistics necessary to gain a deep understanding of financial models, such as (i) stochastic calculus, (ii) probability theory, (iii) linear algebra and (iv) analytic optimisation.
A3.	An advanced knowledge of pricing financial securities (equities, bonds and derivatives) and development of a systematic understanding of their application to areas such as investments and financial risk management.

A4.	Advanced knowledge and critical understanding of the main theoretical and applied concepts in quantitative finance, financial engineering and risk management.
A5.	An advanced knowledge and systematic understanding of the main theoretical and applied concepts in mathematical finance including: hedging strategies; binomial model; risk-neutral valuation; diffusion-type models for stock prices; Black-Scholes equation, stochastic volatility models.
A6.	A comprehensive understanding of interest rate models and interest rate derivatives, and some appreciation of the related credit risk. Also, a comprehensive understanding, measurement and management of market and credit risk.
A7.	An advanced knowledge of the credit rating system and credit risk measures, and a detailed understanding of the credit risk regulatory environment such as Basel II.
A8.	Knowledge and experience in the development of a research enquiry and selection of the tools necessary for executing the research; the skills to pursue independent learning, to analyse and interpret quantitative and qualitative data and to present results in a form that is appropriate [MSc only].
A9.	A critical awareness of research issues, methodologies and methods in quantitative finance and financial engineering combined with a knowledge of corresponding skills in planning and managing a research project equipping students to carry out a piece of research [MSc only].
A10.	A comprehensive understanding and working knowledge of computer programming in C++ with applications in finance
A11.	An advanced knowledge of computational methods applied to asset pricing problems.
A12.	A comprehensive understanding of the theory and practice of portfolio selection, management and performance evaluation in association with market risk measurement and management.
A13.	An advanced knowledge of statistical survival concepts applied to credit risk problems.
A14.	An advanced knowledge of simulation and decision theory tools applied to risk assessment and management.

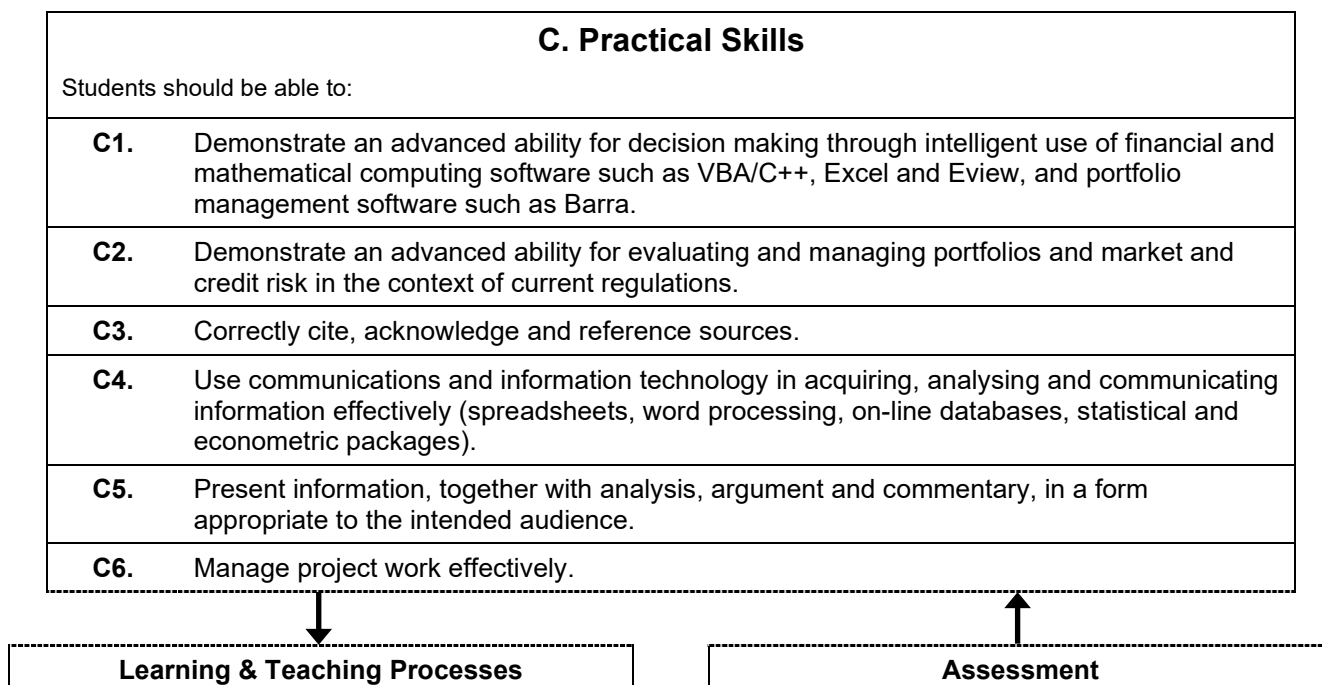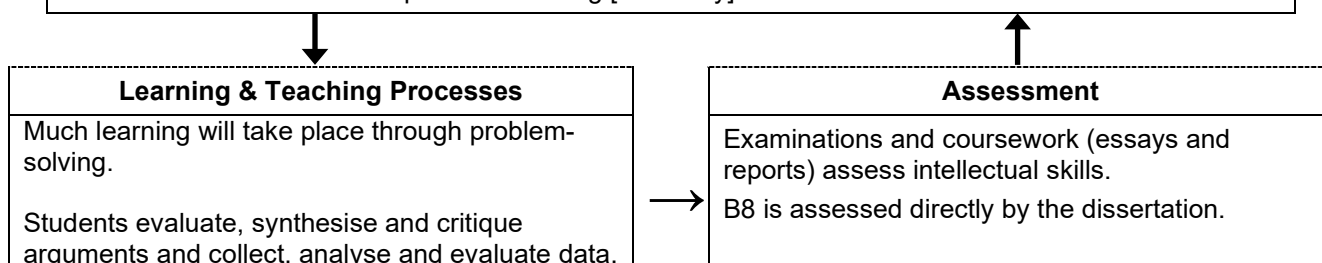| **Learning & Teaching Processes** (to allow students to achieve intended learning outcomes)	**Assessment** (of intended learning outcomes)
We use a variety of teaching methods, depending on the nature of the subject matter and learning objectives for each course unit.	Most courses are assessed partly by an essay/project and an unseen examination paper.
Teaching methods to deliver most of these outcomes (A1 – A12) include a combination of lectures and project-based work.	A13 and A14 are primarily assessed through the dissertation.
Students are expected to supplement lecture material with directed reading, including textbooks, journal articles and the preparation of assignments/exercises in advance of workshops and seminars.	Optional units offer a broader range of assessment methods including group projects and the use of specialised software as appropriate
The dissertation develops A13 and A14. Students also enrich their knowledge and understanding of their chosen dissertation topic through research for and preparation for the dissertation.	

B. Intellectual Skills

Students will be able to:

B1.	Creatively apply sophisticated analytical financial techniques to more specialist areas of investment banking and finance such as asset management and risk management.
B2.	Critically evaluate the major approaches to interest rate, market and credit risk modelling.
B3.	Synthesise and evaluate complex data, including through the use of financial and mathematical software packages.
B4.	Apply the most advanced computational empirical and theoretical tools in finance to translate mathematical/financial problems into computational tasks.
B5.	Analyse, interpret and draw conclusions from the manipulation of financial and other numerical data and the results of computational experiments at an appropriate level.
B6.	Demonstrate autonomy in planning and implementation of tasks through inquiry; logical and critical thinking; formulating and testing hypotheses; and interpretation and evaluation of theoretical arguments and empirical evidence.
B7.	Analyse and interpret asset management and risk management problems in the context of the current and emerging regulatory environment.
B8.	Plan, execute and report on a piece of independent empirical research demonstrating self-direction and independent learning [MSc only].

Learning & Teaching Processes	**Assessment**
Much learning will take place through problem-solving. Students evaluate, synthesise and critique arguments and collect, analyse and evaluate data.	Examinations and coursework (essays and reports) assess intellectual skills. B8 is assessed directly by the dissertation.

C. Practical Skills

Students should be able to:

C1.	Demonstrate an advanced ability for decision making through intelligent use of financial and mathematical computing software such as VBA/C++, Excel and Eview, and portfolio management software such as Barra.
C2.	Demonstrate an advanced ability for evaluating and managing portfolios and market and credit risk in the context of current regulations.
C3.	Correctly cite, acknowledge and reference sources.
C4.	Use communications and information technology in acquiring, analysing and communicating information effectively (spreadsheets, word processing, on-line databases, statistical and econometric packages).
C5.	Present information, together with analysis, argument and commentary, in a form appropriate to the intended audience.
C6.	Manage project work effectively.

Learning & Teaching Processes	**Assessment**

Combination of lectures and group project-based work. Much learning takes place through a problem based approach using case studies. Teaching covers the practical application of techniques and case studies demonstrate the application of techniques in the finance profession.

Students evaluate, synthesise, and critique arguments and collect, analyse and evaluate data.

Assessment of learning takes place through the quality of the students' output and their effectiveness in providing and communicating information.

Practical skills are further developed through workshops, group-based projects and assessed coursework and through individual supervision during the dissertation.

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C1–C6 are assessed primarily in continuous assessment. The dissertation assesses C3–C5 directly.

D. Transferable Skills and Personal Qualities

Students will be able to:

D1.	Analyse mathematical and financial problems in a rigorous and constructive fashion.
D2.	Undertake research in quantitative finance and financial engineering and risk management [MSc only].
D3.	Manage time and work to deadlines.
D4.	Exercise initiative and work independently.
D5.	Demonstrate IT skills including use of the internet, word processing, spreadsheets, financial and mathematical software packages.

Learning & Teaching Processes

Combination of lectures and group project-based work. Much learning is achieved through a problem based approach.

Assessment of learning takes place through the quality of the students' output and their effectiveness in providing and communicating information.

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Assessment

D1 is assessed through coursework and examinations.

D2 is assessed by the dissertation.

D3 is assessed by putting deadlines on coursework submission (penalties for late submission apply) and through examinations.

D4 is assessed through coursework and the dissertation.

D5 is assessed through coursework and formatively throughout the programme.

4. THE STRUCTURE OF THE PROGRAMME(S)

Programme structure and credits   **Credits**

MSc Quantitative Finance	
Semester One	
Three core course units for	
BMAN 70381 Asset Pricing Theory	15
BMAN 71541 Stochastic Calculus for Finance	15
BMAN 70141 Derivative Securities	15
One course unit from	
BMAN 71171 Portfolio investment	15
BMAN 70211 Cross-sectional Econometrics	15
MATH 69111 Scientific Computing	15
Semester Two	
Three core course units	
BMAN 71122 Time-series Econometrics	15
BMAN 63012 Interest Rate Derivatives	15
BMAN 71572 Credit Risk Management	15
One course unit from	
BMAN 71152 Corporate Finance	15
BMAN 60092 Risk, Performance and Decision Analysis	15
BMAN 70142 Simulation and Risk Analysis	15
~~BMAN 70192 Real Options in Corporate Finance~~	~~15~~
MATH 60082 Computational Finance	15
MATH 68052 Generalised Linear Models and Survival Analysis	15
BMAN 65000 MSc Dissertation in Quantitative Finance	60
Total Credits	180

5. STUDENT INDUCTION, SUPPORT AND DEVELOPMENT

Induction

The induction programme for students on the MSc in Quantitative Finance includes an introduction to Alliance Manchester Business School and some sessions are shared with induction activities for other postgraduate taught programmes in the School. Some activities are common with students on the MSc in Mathematical Finance, run by the School of Mathematics.

Programme handbook

All students access the Online Programme Handbook on arrival. This includes comprehensive information on all aspects of the programme, and has specific advice on the dissertation process and the support available. The handbook also contains practical information about Alliance Manchester Business School and the Faculty of Humanities.

All information is also available on the web and intranet sites for AMBS and the Faculty of Humanities.

Personal tutoring and student support

A personal tutoring and support system is offered via the Programme Director and the Programme Administrator who are available to offer support/advice to students about teaching matters or personal issues affecting their studies. This system provides support and advice on academic issues and also directs students to appropriate support services within the University. Students have the opportunity to undertake a Personal Development Plan, which can be facilitated by the support system and by the dissertation supervisor when appointed. Personal Development Planning (PDP) is a structured and supported process undertaken by an individual to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development. The primary objective of PDP is to improve the capacity of individuals to understand what and how they are learning, and to review, plan and take responsibility for their own learning.

Overseas students

Overseas students are encouraged to attend English Language courses provided by the University Language Centre. Alliance MBS liaise with the University's International Office to ensure there is support for overseas students.

Mathematical Support

Some students may find the Mathematical elements of the programme challenging. The School of Mathematics provides students with access to remedial support and counselling in Mathematics. Strong mentoring takes place at induction and during the first two weeks of the programme.

Students should also be aware of the University pastoral support structures available to them:
- Careers service: www.careers.manchester.ac.uk
- Office of Student Support and Services: www.campus.manchester.ac.uk/studentsupportandservices
- Student Services Centre: www.campus.manchester.ac.uk/ssc/

Skills Training

IT Support for the curriculum is provided by the School of Mathematics. In particular, Mathematics provide training in C++ for students who have not done any C++ previously. This is undertaken during the induction week prior to the programme's starting. Students are made aware of this upon registration and are advised to attend the training as appropriate.

The Graduate School in Mathematics offers students the opportunity to attend various courses on such topics as time management, report writing, etc. Students are also expected to attend postgraduate research seminars in both Manchester Business School and the School of Mathematics.

Dissertation support

Alliance MBS seek dissertation titles from industry where possible.
Dissertations and supervisors are allocated to students based on the interests of students.

Structured support for dissertations is dependent upon the subject area and the discipline of the supervisor. Alliance MBS schedule five formal sessions with the supervisor but students can meet with supervisors in addition to that as required. Dissertation supervisors can also support PDP through

discussion of students' reflections.

Student representation
Students nominate student representatives who sit on the Divisional PGT Committees. The Students' Union offers training and support for students in this role. Student representatives also meet with the School's Director and the School's PGT director during the year.

6. CURRICULUM MAP OF COURSE UNITS AGAINST INTENDED LEARNING OUTCOMES OF THE PROGRAMME

D = intended learning outcomes of the programme are taught or developed by students within this course unit

C = compulsory course unit

A = intended learning outcomes of the programme are assessed within this course unit

O = optional course unit

Course Unit Title and Code (including dissertations and other programme components)			Knowledge & Understanding														
Code	Course Unit title	C/O	A1	A2	A3	A4	A5	A6	A7	A8	A9		A10	A11	A12	A13	A14
BMAN70381	Asset Pricing Theory	C	DA	DA	DA	DA	DA								DA		
MATH 69111	Scientific Computing	O			DA		DA						DA				
BMAN 71541	Stochastic Calculus for Finance	C		DA		DA	DA										
BMAN70141	Derivatives Securities	C̶O̶	DA	DA	DA	DA	DA	DA									
BMAN71171	Portfolio Investment	O	DA	DA	DA		DA	DA							DA		
BMAN70211	Cross-sectional Econometrics	O		DA						DA	DA						
BMAN63012	Interest Rate Derivatives	C	DA	DA	DA	DA	DA	DA	DA					DA			
BMAN71122	Time-series Econometrics	C			DA			DA									
~~BMAN70192~~	~~Real options in Corporate Finance~~	~~O~~	~~DA~~	~~DA~~	~~DA~~		~~DA~~										
BMAN71572	Credit Risk Management	C	DA	DA	DA	DA	DA	DA	DA					DA		DA	
MATH60082	Computational Finance	O			DA		DA						DA	DA			DA
MATH 68052	Generalised Linear Models and Survival Analysis	O		DA													
BMAN60092	Risk, Performance and Decision Analysis	O	DA		DA												DA
BMAN71042	Simulation and Risk Analysis	O	DA		DA												DA
BMAN 71152	Corporate Finance	O								DA	DA						
	Dissertation	C	DA	DA	DA	DA	DA	DA	DA	DA	DA		DA	DA	DA	DA	DA

Legend for cells:

 D = intended learning outcomes of the programme are taught or developed   C = compulsory course unit
 by students within this course unit

 A = intended learning outcomes of the programme are assessed within this   O = optional course unit
 course unit

Code	Course Unit title	C/O	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5
BMAN70381	Asset Pricing Theory	C	DA										DA	DA	DA		DA		DA	DA	DA
MATH69111	Scientific Computing	O	DA		DA	DA	DA			DA	DA			DA	DA	DA	DA	DA	DA	DA	DA
BMAN 71541	Stochastic Calculus for Finance	C	DA					DA		DA			DA		DA		DA	DA	DA	DA	DA
BMAN70141	Derivatives Securities	C	DA	DA			DA							DA	DA		DA		DA	DA	DA
BMAN71171	Portfolio Investment	O	DA		DA		DA	DA			DA	DA		DA	DA	DA	DA	DA	DA	DA	DA
BMAN70211	Cross-sectional Econometrics	O	DA	DA	DA		DA	DA			DA			DA					DA	DA	DA
BMAN63012	Interest Rate Derivatives	C	DA	DA			DA						DA	DA	DA		DA		DA	DA	DA
BMAN71122	Time-series Econometrics	C	DA		DA	DA	DA	DA		DA	DA		DA	DA	DA	DA	DA	DA	DA	DA	DA
~~BMAN70192~~	~~Real options in Corporate Finance~~	~~O~~	~~DA~~				~~DA~~	~~DA~~					~~DA~~	~~DA~~	~~DA~~	~~DA~~	~~DA~~		~~DA~~	~~DA~~	~~DA~~
BMAN71572	Credit Risk Management	C	DA	DA					DA			DA	DA	DA	DA		DA		DA	DA	DA
MATH60082	Computational Finance	O			DA	DA	DA			DA	DA		DA	DA	DA	DA	DA	DA	DA	DA	DA
MATH 68052	Generalised Linear Models and Survival Analysis	O			DA	DA	DA	DA						DA	DA	DA	DA		DA	DA	DA
BMAN60092	Risk, Performance and Decision Analysis	O										DA	DA	DA	DA		DA		DA	DA	
BMAN71042	Simulation and Risk Analysis	O										DA	DA	DA	DA		DA		DA	DA	DA
BMAN71152	Corporate Finance	O			DA	DA		DA						DA	DA	DA	DA		DA	DA	DA
	Dissertation	C	DA		DA	DA	DA	DA	DA	DA	DA		DA	DA	DA	DA	DA	DA	DA	DA	DA

7. CRITERIA FOR ADMISSION

Candidates must be able to satisfy the general admissions criteria of the University and of the School in at least one of the following ways:

A high Upper Second Class Honours degree in Finance, Economics, Mathematics, Engineering, Actuarial Science, Physics and other related degrees, with good quantitative marks, or the overseas equivalent in a related discipline. We will also consider exceptional candidates with degrees in other disciplines and more mature students with practical experience in finance and a good first degree in any area.

We highly recommend GMAT or GRE for applications to all our accounting and finance related programmes. We anticipate a well-balanced score with a strong performance in the quantitative sections.

In addition, overseas students may need to take IELTS with a minimum score of 7 (with no individual element below 6) or TOEFL 100 overall with speaking and writing 22, and listening and reading 21.

English language:

For the latest information on demonstrating your English proficiency for those whose first language is not English, please see our language requirements .

English language test validity:

Some English language test results are only valid for two years. Your English language test report must be valid on the start date of the course.

Other international entry requirements:

We accept a range of qualifications from different countries. For these and general requirements see entry requirements for your country .

8. PROGRESSION AND ASSESSMENT REGULATIONS

The ordinances and regulations for the degrees of Masters, Postgraduate Diploma and Postgraduate Certificate will apply to this programme. Details of the ordinances and regulations can be found at http://www.tlso.manchester.ac.uk/degree-regulations/postgraduatedegreeregulations/

Date of original production:	11 November 2005
Date of first revision:	27 March 2007
Date of second revision:	6 December 2008
Date of third revision:	4 May 2010
Date of fourth revision:	December 2012
Date of fifth revision:	March 2014
Date of sixth revision	21 January 2015
Date of seventh revision	21 May 2016
Date of eighth revision	14 October 2021

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