Programme Specification

Operational Research and Finance (2018-19)

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of Study	Full-time
Duration in years	1
Accreditation details	None
Final award	Master of Science (MSc)
Name of award	Operational Research and Finance
Interim Exit awards	Postgraduate Certificate
	Postgraduate Diploma
FHEQ level of final award	Level 7
UCAS code	n/a
Programme code	4732
QAA Subject Benchmark or other external reference	Mathematics, Statistics And Operational Research 2007
Programme Lead	Honora Smith (hks1u06)

Programme Overview

Brief outline of the programme

An MSc is generally accepted as being highly desirable for starting and developing a career as a financial analyst or for developing a career in Operational Research. It is also a good preparation for research work.

This programme, with its vocational focus, is designed to provide a firm grounding in financial knowledge suitable for a career in financial institutions, while combining this with training in a broad range of additional numerate skills covering mathematical modelling and optimization.

A highlight of the programme is the 3-month summer project. The student is usually placed with a nearby company and works on a real problem of practical importance to that company.

The Southampton MSc in OR and Finance can be obtained by full-time or part-time study.

Your contact hours will vary depending on your module/option choices. Full information about contact hours is provided in individual module profiles.

Learning and teaching

The full-time MSc programme is completed over a 12-month period. There are two semesters of taught material, lasting for just over 8 months, which account for 60 ECTS/120 CATS (Diploma level).

There is also a regular seminar series, with speakers from a wide range of organisations providing an appreciation of the developments in and use of OR in practice.

You will be provided with training and education in the techniques, methods and approaches of Operational Research, together with their application to practical problems arising in organisational contexts, and in financial markets and corporate finance. The structure allows you to select options from a range of additional financial topics as well as further aspects of operational research. While studying for your degree, you will develop key work skills, such as written and oral communication, presentation skills, the use of IT, teamwork, time management, and basic research skills including the use of the web and the library.

Assessment

The Diploma programme comprises the two semesters of taught material, with assessment via coursework assignments and examinations, which take place at the end of each semester. The MSc programme is completed subject to achievement of progression requirements with a project lasting about 3 months.

Special Features of the programme

The MSc Programme CORMSIS Business Advisory Board

This Business Advisory Board is a good indicator of the high regard in which the Southampton MSc programmes involving OR are held by outside organisations. Its purpose is to ensure that the MSc programmes produce graduates with the requisite skills for the needs of industry. It also provides a focal point for liaison between the OR Group and industry. You have the chance to meet the Committee several times during the year. Major companies including BT, British Airways, the AA, Dstl, RNLI and HM Revenue & Customs are represented on the Advisory Board.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

Educational Aims of the Programme

The aims of the programme are to:

- Introduce you to the ideas of mathematical model building;
- Introduce you to the main techniques, methods and approaches of Operational Research emphasising both the underlying concepts and their practical application;
- Introduce you to the operation of financial and derivative markets;
- Introduce you to the fundamentals of corporate finance;
- Offer you the opportunity to study more specialised topics selected from a range of options, but within a coherent framework;

· Develop your Operational Research skills for problem solving, including modelling of deterministic and stochastic systems, and designing solution approaches;
· Give you the practical experience of applying the problem-solving skills you have learned, by working on a project, normally with an external organisation;
· Develop key transferable skills, including personal organisation, teamwork, finding and using information, and written and oral communication.

Programme Learning Outcomes

Knowledge and Understanding

On successful completion of this programme you will have knowledge and understanding of:

A1. A range of deterministic and stochastic Operational Research techniques that are required for tackling a variety of quantitative management problems, with special emphasis on financial applications;

A2. Financial and derivative markets;

A3. The fundamentals of corporate finance;

A4. The use of IT resources, including spreadsheets, databases, Python programming, and computer packages for selected financial and Operational Research techniques.

Teaching and Learning Methods

Acquisition of knowledge and understanding is through structured exposition based on lectures, computer workshops, private study, seminars, case studies, and individual and group coursework.

Assessment Methods

Every module is assessed, often by a combination of unseen examinations and coursework, although some modules are assessed by examination or coursework alone. This variety of assessment relates to A1-A4, and also to some of the skills described below. Some of the coursework requires the use of computers to solve problems (A5), reports to be written, and oral presentations to be made.

Subject Specific Intellectual and Research Skills

On successful completion of this programme you will be able to:

B1. Evaluate quantitative management problems and to construct appropriate mathematical models;

B2. Analyse mathematical models and select a suitable solution methodology;

B3. Apply the main Operational Research techniques, such as mathematical programming, simulation and statistical methods;

B4. Analyse and critically appraise the operation of financial markets;

B5. Analyse and appreciate the rationale of corporate finance;

B6. Use computer packages for certain financial and Operational Research techniques and interpret the output;

B7. Apply financial and Operational Research techniques and approaches to a project, normally tackling a real-life problem with an external organisation

Teaching and Learning Methods

The use of mathematical models and their solution by applying suitable techniques is fundamental in quantitative financial methods and in Operational Research, and so this is emphasised throughout the teaching and learning experience when using the methods given in Knowledge and Understanding section. Computer programming is taught through Python, and spreadsheet modelling through Excel. Specialist computer packages are used for financial forecasting, mathematical programming, simulation and statistics.

Assessment Methods

The various methods of assessment involve analysis, modelling and problem solving (B1- B5). Where computer work is involved, coursework is the vehicle whereby the skills learned are assessed (B6). The project involving the practical application of Operational Research is assessed by a dissertation (B7).

Transferable and Generic Skills

On successful completion of this programme you will be able to:

C1. Write reports on your analysis of a problem together with your results and conclusions; Undertake oral presentations for various audiences;

C2. Demonstrate teamwork skills;

C3. Apply IT skills;

C4. Collect and synthesise information from a variety of sources including the internet, textbooks and journal articles;

C5. Practice the skills you have acquired (organisation, time management, problem solving, critical analysis, independent learning, etc.) that will support lifelong learning.

Teaching and Learning Methods

A variety of methods of teaching and learning are used, appropriate to the learning outcomes as described above. An induction programme teaches written and oral communication skills, and team

working, and these skills are used in several modules. Written and oral communication skills are developed further in the module Presenting Reports. The use of IT plays an important role throughout the programme. During the project, your portfolio of skills, including library research, time management and communication, is developed further.

Assessment Methods

Throughout the programme, the clear communication of your analysis and problem-solving approach is part of the assessment criteria, either implicitly or explicitly. For the coursework and project work, a proportion of the assessment is related to communication (C1 and C2) and where appropriate to the appropriate use of IT (C4) and to internet and library research (C5). Some coursework involves working in groups, and a proportion of the assessment is assigned to teamwork skills (C3). The skills referred to in C6 are implicit in all modules, and their mastery will contribute to the overall standard of your work.

Programme Structure

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Part I

Typical programme content

This programme, with its vocational focus, is designed to provide a firm grounding in financial knowledge suitable for a career in financial institutions, while combining this with training in a broad range of additional numerate skills covering mathematical modelling and optimization. The programme has close links with the MSc in Business Analytics and Finance in Southampton Business School, with many optional modules available to both sets of students and a common set of projects on which to base a dissertation.

The programme may be completed on either a full-time (12 months) or part-time (24 months) basis. Part-time students take the taught modules over two nine-month periods, and subject to timetabling restrictions are allowed some flexibility as to which modules are taken in the two periods.

Programme details
The structure of the programme and the modules currently offered are set out below. Of the modules shown against each part of your programme, some are compulsory (i.e. enrolment is automatic) and others are optional. Against each part, you are directed to which modules are compulsory and which are optional. The optional modules listed constitute an indicative list. There will always be choice but the options might vary between parts. A list of optional modules will be available to you via the Student Record Self-Service system once you enrol at the University.

A flexible and inclusive approach to learning and teaching will enable any student who meets the entry requirements to access the curriculum and demonstrate achievement of all the intended learning outcomes. The approach should minimise the need for individual alternations to be made for disabled students.

The programme is normally studied over 12 months full-time (or 27 months part-time).The taught component of the programme consists of 30 study weeks divided into two semesters during which time students study a number of modules (60 ECTS/120 CATS). Students who successful complete the taught component undertake a three-month period of supervised research for a Master's dissertation (six months for part-time students) at a value of 30 ECTS/60 CATS).

Part I Compulsory

Code	Module Title	ECTS	Type
MANG6022	Corporate Finance 1	7.5	Compulsory
MATH6147	Data Analytics	3.75	Compulsory
MATH6005	Introduction to Python	3.75	Compulsory
MATH6145	Presenting Reports	3.75	Compulsory
MATH6001	Project	30	Compulsory
MATH6006	Statistical Methods	7.5	Compulsory

Part I Core

Code	Module Title	ECTS	Type
MATH6002	Deterministic OR Methods	7.5	Core
MATH6004	Stochastic OR Methods	7.5	Core

Part I Optional

Students must select one module from the following three modules :
MANG6020 Financial Risk Management
MANG6008 Quantitative Research Methods in Finance
MANG6023 Corporate Finance II

In addition students must select 22.5 CATS worth of additional modules from the optional list

Code	Module Title	ECTS	Type
MATH6119	Analytical Consultancy Skills	3.75	Optional
MATH6112	Computer-based statistical modelling	3.75	Optional

MANG6023	Corporate Finance 2	7.5	Optional
MANG6169	Credit Risk and Banking Regulation	3.75	Optional
MANG6054	Credit Scoring and Data Mining	3.75	Optional
COMP6234	Data Visualisation	7.5	Optional
MATH6017	Financial Portfolio Theory	3.75	Optional
MANG6020	Financial Risk Management	7.5	Optional
MATH6011	Forecasting	3.75	Optional
MANG6100	Game Theory for Business	3.75	Optional
MATH6158	Managing Uncertainty and Risk	3.75	Optional
MANG6229	Multivariate Statistics for Data Mining	3.75	Optional
MATH6120	Nonlinear Optimisation	3.75	Optional
MANG6008	Quantitative Research in Finance	7.5	Optional
MANG6231	Software for Data Analysis and Modelling	3.75	Optional
MANG6331	Text Mining and Social Network Analytics	3.75	Optional

Part II

Part II Compulsory

Code	Module Title	ECTS	Type
MATH6001	Project	30	Compulsory

Progression Requirements

The programme will follow the University's regulations for ***Progression, Determination and Classification of Results: Undergraduate and Integrated Masters Programmes*** or the University's regulations for ***Progression, Determination and Classification of Results: Standalone Masters Programmes*** as set out in the General Academic Regulations in the University Calendar: http://www.calendar.soton.ac.uk/sectionIV/sectIV-index.html

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling. Support includes daily Drop In at Highfield campus at 13.00 – 15.00 (Monday, Wednesday and Friday out of term-time) or via on-line chat on weekdays from 14.00 – 16.00. Arrangements can also be made for meetings via Skype.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia).
- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Career and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls and in the local community, (18.00-08.00)
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

Associated with your programme you will be able to access:

· Module co-ordinators support. Module co-ordinators will be available at designated times during the week to discuss issues related to the particular modules you are studying at the time. This will be in addition to class contact time.

· Personal academic tutor. As soon as you register on this programme, you will be allocated a personal academic tutor. S/he is a member of the academic team and will be available to discuss general academic issues related to the programme as well as offer advice and support on any personal issues which may affect your studies.

· Module handbooks/outlines. These will be available at the start of each module (often in online format). The handbook includes the aims and learning outcomes of the module, the methods of assessment, relevant background material to the module and a session-by-session breakdown of the module together with

appropriate reading lists.
· Within the Faculty, administrative support is provided by your Student Office which deals with student records and related issues and with queries related to your specific degree programme.

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

· Completing student surveys for each module of the programme
· Acting as a student representative on various committees, e.g. Staff: Student Liaison Committees, Faculty Programmes Committee OR providing comments to your student representative to feedback on your behalf.
· Serving as a student representative on Faculty Scrutiny Groups for programme validation
· Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group

The ways in which the quality of your programme is checked, both inside and outside the University, are:

· Regular module and programme reports which are monitored by the Faculty
· Programme validation, normally every five years.
· External examiners, who produce an annual report
· A national Research Excellence Framework (our research activity contributes directly to the quality of your learning experience)
· Institutional Review by the Quality Assurance Agency

The programme content is regularly reviewed by the CORMSIS Business Advisory Board. This ensures that you will be taught topics held to be important by business and industry.

Further details on the University's quality assurance processes are given in the *Quality Handbook.*

Career Opportunities

Operational Research (OR) is the application of scientific methods to the study of complex organisational problems: combined with financial modelling expertise, this additionally gives a background in the workings of financial institutions. Even within the same organisation OR tends to be highly varied because of its project-driven nature. The breadth of experience gained by a study of OR and Finance (ORF) offers an exciting and rewarding career in many organisations, financial or otherwise, enabling many to progress to a career in financial or general management. Moreover the nature of the work brings an ORF graduate into early contact with senior management, and career advancement is typically rapid.

External Examiner(s) for the programme

Name: Dr Jonathan Thompson - Cardiff University

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff:

Student Liaison Committee in the first instance, and Student representatives on Staff: Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their Personal Academic Tutor in the first instance.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Appendix 1:

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme also have to pay for:

Additional Costs

Type	Details
Software Licenses	Licenses for software recommended as part of the programme will be provided by the university on university machines. In some cases, students may wish to purchase software to use on their own computers.
Hardware	Public workstations are available, but iPads, laptops etc., are to be purchased as the student wishes.
Stationery	You will be expected to provide your own day-to-day stationary items (e.g. pens, pencils, notebooks, etc). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.
Textbooks	Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Placements (including Study Abroad Programmes)	Where placements involve working away from Southampton, the additional costs of travel and accommodation will usually be covered by a bursary that is given to the student at the start of the project.
Approved Calculators	Candidates may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University approved model is Casio FX-570 This may be purchased from any source and no longer needs to carry the University logo.
Optional Visits (e.g. museums, galleries)	We offer the possibility of optional off-site visits occasionally during the programme. When these occur, students may be expected to cover the associated transport costs.
Printing and Photocopying Costs	In the majority of cases, coursework such as essays; projects; dissertations is likely to be submitted on line. However, there are some items where it is not possible to submit on line and students will be asked to provide a printed copy. A list of the University printing costs can be found here: http://www.southampton.ac.uk/isolutions/students/printing-for-students.page. Dissertations should be soft bound. Up-to-date prices can be found here: http://www.southampton.ac.uk/printcentre/dissertation_thesis/binding.page

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at www.calendar.soton.ac.uk.