Programme Specification

Mathematics, Operational Research, Statistics and Economics (MMORSE) (2020-21)

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	4
Accreditation details	None
Final award	Master of Mathematics (Honours) (MMath)
Name of Award	Mathematics, Operational Research, Statistics and Economics (MMORSE)
Interim Exit awards	Bachelor of Science (Ordinary) Certificate of Higher Education (CertHE) Diploma of Higher Education (DipHE)
FHEQ level of final award	Level 7
UCAS code	GL11
Programme Code	6979
QAA Subject Benchmark or other external reference	Mathematics, Statistics And Operational Research 2007
Programme Lead	Thanos Avramidis
Pathway Lead	

Programme Overview

Brief outline of the programme

This four year programme will enable you to develop your skills and mathematical knowledge, beyond the normal range of a three-year degree, in topics including Mathematics, Statistics, Operational Research and Economics. These different topics are related in that they all rely on using mathematical methods to formulate, model, analyse and solve a wide range of problems.

While studying for your degree, you will develop key study and work skills including written and oral communication, the use of IT, team working, time management and basic research skills including the use of the web and the library.

The programme is centred on a coherent framework of study but incorporates flexibility so that there is ample opportunity to choose topics of special interest to you. This degree may lead to possible exemption from some Core Technical professional actuarial examinations depending on option choices made.

Transfer to this programme is possible from a number of Mathematics programmes in the first year and in some cases even in the second year and from BSc MORSE until the end of year 3. Transfer from this programme to BSc Mathematics or BSc MORSE is normally possible until the end of year 3.

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 Mathematical Sciences School uses a wide variety of modern learning and teaching methods involving small group tutorial work and computer based learning that builds on what you learn in lectures.

Assessment
Assessment is varied enabling you to demonstrate your strengths and show what you have learnt. Students are provided with access to relevant software that they can use on their own personal computers to assist their studies.

Special Features of the programme

The programme itself is not accredited but the inclusion of the "Actuarial Science" modules as options means that some students may be able to claim exemptions from the Institute and Faculty of Actuaries. The exemptions are dependent on students achieving a minimum grade in the relevant module(s), and this grade is set by the Faculty & Institute of Actuaries on an annual basis. The details of potential exemption-mapping are set out below.

CT1 | Financial Mathematics | MATH2040/ MATH6131| Financial Mathematics| 100%
CT2 | Finance and Financial Reporting | MANG2014/MANG3019/MANG6225 | 100%
CT3 | Probability and Mathematical Statistics | MATH1024 |Introduction to Probability and Statistics | 40%
CT3 | Probability and Mathematical Statistics | MATH2011 | Statistical Distribution Theory | 40%
CT3 | Probability and Mathematical Statistics | MATH2010 | Statistical Methods I
CT4 | Models | DEMO2002/DEMO3001/DEMO3011 | Demography | 50%
CT4 | Models | MATH2012/MATH6128 | Stochastic Processes | 50%
CT5 | Contingencies | MATH3063/MATH6129 | Actuarial Mathematics I | 50%
CT5 | Contingencies | MATH3066/MATH6130 |Actuarial Mathematics II | 50%
CT6 | Statistical Methods | STAT3010/STAT6001 | Statistical Methods in Insurance | 100%
CT7 | Economics | ECON1001/ECON1003 | Foundations/Principles of Microeconomics | 50%
CT7 | Economics | ECON1002 | Principles of Macroeconomics | 50%
CT8 | Financial Economics | MATH3022/MATH6127 | Mathematical Finance | 100%

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 main basic areas of Mathematics, Operational Research, Statistics and Economics;
- Develop your understanding of abstract mathematical concepts;
- Offer you the opportunity to study advanced mathematical concepts and techniques;
- Develop your modelling and problem solving skills;
- Offer you the opportunity to construct an individual programme of study within a coherent framework;
- Offer you the opportunity to study applications of mathematics in a variety of contexts which utilize mathematical and statistical models;
- Allow you to study applications of operational research in solving the type of quantitative problems that arise in organisations;
- Offer you the opportunity to study advanced mathematical model building and optimization, including theoretical deterministic and stochastic concepts;
- Introduce you to theoretical statistical concepts;

· Develop your understanding of practical statistical methods;
· Equip you with knowledge and understanding of core areas of economics such as microeconomics, macroeconomics and quantitative methods;
· Develop your subject specific and transferable skills including an analytical approach to problem solving, logical argument and deductive reasoning, abstraction and generalisation, and written communication skills in mathematics;
· Provide some of the basic IT skills necessary for further study and employment, including word processing and use of the internet;
· Help you to develop key skills: personal organisation, teamwork, problem solving and analysis, finding and using information, and written and oral presentation.

Programme Learning Outcomes

Knowledge and Understanding

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

A1. Advanced research methods in algebra, analysis, geometry and topology,
A2. Technical skills in the use of mathematical tools for calculation and for the construction of sophisticated proofs and other lines of mathematical reasoning,
A3. A deep understanding of how mathematical concepts and methods are applied to solve complex problems,
A4. A range of mathematical modelling techniques including use of graphical networks, cost models, stochastic and decision processes, and statistical modelling;
A5. Computer-based modelling and optimization methods including packages in optimization and simulation;
A6. Central concepts and arguments in both microeconomics and macroeconomics.
A7. Advanced scholarship in a wide range of areas of mathematics, operational research, statistics and economics.

Teaching and Learning Methods

Acquisition of knowledge and understanding of A1 through A7 is through structured exposition based on lectures, tutorial classes, workshops, private study, and computer laboratory work, all of which are equally important. Increasing independence of learning is required as the programme progresses.

Throughout the programme you are encouraged to use additional recommended reading material for private study to consolidate the formal learning process, and to broaden and deepen your understanding.

Assessment Methods

Assessment is undertaken in the first year by a mixture of unseen examinations, regular marked coursework, class tests and computer-based work, together with a small component of project and laboratory work. This variety of assessment relates to A1 through A3, and also to some of the skills described below. This varied approach to assessment continues in the remainder of the programme, with the relative emphasis depending on the options chosen (A4 - A7).

Subject Specific Intellectual and Research Skills

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

B1. Use mathematical problem-solving skills for certain types of problems and their variants in a variety of mathematical contexts;
B2. Undertake algebraic calculations accurately and with understanding;
B3. Use computer packages (for example, R) as vehicles for mathematical exploration and understanding;
B4. Understand and to construct mathematical proofs;
B5. Appreciate, construct and analyse mathematical models of practical situations;
B6. Apply a range of operational research methods, such as mathematical programming, inventory control and queuing theory, to practical situations;
B7. Abstract the essential features of complex economic systems and provide a usable framework for the evaluation and assessment of the effects of policy or other exogenous events;
B8. Apply logical analysis to assumption based economic models and make use of inductive reasoning.

Teaching and Learning Methods

Problem-solving is at the heart of all mathematical activity, and so it is emphasised throughout the learning and teaching experience, as is the need for accurate calculation and logical argument. The use of specific mathematical and computational packages is a part of the curriculum, and the skills acquired there are used in later modules as appropriate.

Assessment Methods

The various methods of assessment described in section 2 involve problem-solving (B1) in addition to the assessment of knowledge and understanding (B2, B4 through B8). Fluency in computer packages (B3) is assessed by coursework.

Transferable and Generic Skills

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

C1. Communicate mathematical ideas in written form;
C2. Undertake oral presentations;
C3. Demonstrate group-working skills
C4. Use email, spreadsheets and show basic word-processing skills;
C5. Use and obtain information from a variety of different sources including the internet, books and other printed material;
C6. Use the skills you have acquired (e.g. time-management, organisation, problem-solving, critical analysis, independent learning, etc.) for life-long learning.

Teaching and Learning Methods

The learning of transferable skills begins in the first year. The first year lecturers will set problems for which one of a range of computing packages, such as statistics package R, will be useful, thereby developing transferable skills alongside subject specific skills. Other IT skills such as basic word processing are used alongside first year project work, particularly in statistics. Extensive electronic resources on study skills are available through the Mathematics and University websites.

Further development of IT skills, written communication and general skills such as organisation and time-management is associated to optional second and third year modules that may an element of

coursework in their assessment. The second and third year project-based modules develop your portfolio of skills to include internet and library research, group working, and presentation skills.

Assessment Methods

Throughout the programme the clear communication of mathematics is part of the assessment criteria, either explicitly or implicitly. For project work, and for those modules that involve coursework assignments, a proportion of the assessment is allocated to communication (C1, C2, and C4). Project work and coursework assessment also relate to C5, and where appropriate, C3. The skills referred to in C6 refer to problem-solving, an integral component of all mathematical work, and other learning skills are implicit.

Programme Structure

The programme structure table is below:

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

Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note in some instances modules have limited spaces available.

Pathway

Part I
Typical programme content

The first three years are very similar to the BSc MORSE programme but the fourth year will involve studying more challenging Masters level mathematics and you will have much more flexibility in choosing the direction of your programme. You will undertake a full year individually supervised project on a topic, which you can choose, and several of the lecture modules involve directed self-study and reading involving such topics as hyperbolic geometry, differential geometry, asymptotics, continuum mechanics, design of experiments, Bayesian methods and survival analysis. We have suggested a number of 'pathways' in the final year and this will involve careful consideration of choices in year three in particular. You are none the less free to choose, with the approval of the Programme Director, any modules for which you have the necessary pre-requisites. The final year as a whole will equip you with many of the skills you need in a career as a professional mathematician, operational researcher and/or statistician.

In addition to this, our Curriculum Innovation Programme offers our students the chance to take optional modules outside their core disciplines, during the third year of their studies. This allows you to personalise your education, to develop new skills and knowledge for your future.

Programme details

The structure of the programme and the modules currently offered are set out below. Of the modules shown against each year of your programme, some are compulsory (ie enrolment is automatic) and others are optional. Against each year, 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 years. A list of optional modules will be available to you via the Student Record Self-Service system once you enrol at the University.

The programme comprises four parts, each corresponding to one year of full-time study. You will normally

have to take 4 modules (30 ECTS) each semester (ie 8 modules (60 ECTS) in each year of the programme. Each CATS point can be considered as the equivalent of approximately ten hours of study. All the modules offered in this programme (except MATH1056 and a number of the fourth year options) are 7.5 ECTS modules. This means that each module comprises around 150 hours of study divided into contact time (e.g. lectures, seminars, workshops) and non-contact time when you will be engaged in directed study (preparation for classes) and independent study when you will be involved in producing assignments and preparing and taking examinations.

In Part 4 there are a number of options that are normally taught as part of the MSc Actuarial Science or the MSc Operational Research but which are available to MMORSE students, providing they have not taken related module(s) in Parts 1, 2 and 3. In particular the Part 4 modules involved include MATH6127, MATH6128, MATH6129, MATH6130, MATH6131 and MANG6225.

The first two Parts of the programme are fairly general and are the same as those for the BSc MORSE programme. From Part 3 onwards, students are recommended to specialise in one the of following areas but other options are allowed with the approval of the Programme Director

1. Actuarial and Financial Mathematics
2. Operational Research, Management Science and Statistics
3. Mathematics and Statistics

A suggested collection of optional modules which may be taken in each of these three areas might be
1. MATH3063/MATH6129, MATH3066/MATH6130, STAT3010, MATH3022/MATH6127, MANG6225, MANG6022, MANG6023, MANG6020, ECON3010
2. MATH3013, MANG3010, MANG3034, MANG6100, MATH6011, MANG6008
3. MATH2003, MATH3091, MATH3085, MATH3033, MATH6027, STAT3010, MANG6231

Other choices of modules are allowed under each of these three areas.
Students must take at least 16 MATHxxxx modules in parts 1, 2 and 3, and at least 4 MATH3xxx modules in part 3.
The choice of modules in Part 4 must be approved by the Programme Director.

Variation to Regulations: In order to progress to Part IV of the programme, students must achieve an average Pass Mark of 60% in Part III.

Part I Compulsory

Code	Module Title	ECTS	Type
MATH1024	Introduction to Probability and Statistics	7.5	Compulsory
MATH1049	Linear Algebra II	7.5	Compulsory
MATH1060	Multivariable Calculus	7.5	Compulsory
MATH1058	Operational Research I and Mathematical Computing	7.5	Compulsory
ECON1002	Principles of Macroeconomics	7.5	Compulsory

Part I Core

Code	Module Title	ECTS	Type
MATH1059	Calculus	7.5	Core
MATH1048	Linear Algebra I	7.5	Core

Part I Optional
Either ECON1003 Principles of Microeconomics Or ECON1001 Foundations of Microeconomics. If you have NOT passed Economics at A Level, or an equivalent level, you MUST select ECON 1001,
if you HAVE passed Economics at A Level you must select ECON 1003.

Code	Module Title	ECTS	Type
ECON1001	Foundations of Microeconomics	7.5	Optional
ECON1003	Principles of Microeconomics	7.5	Optional

Part II

Part II Compulsory

Code	Module Title	ECTS	Type
MATH2039	Analysis	7.5	Compulsory
ECON2007	Econometrics with Big Data	7.5	Compulsory
MATH2013	Operational Research II	7.5	Compulsory
MATH2038	Partial Differential Equations	7.5	Compulsory
MATH2011	Statistical Distribution Theory	7.5	Compulsory
MATH2010	Statistical Modelling I	7.5	Compulsory

Part II Optional
The option modules shown below constitute an indicative list; there will always be choice but the options might vary between years. A full list of option modules and rules will be available to you via the Student Record Self-Service system once you enrol at the University.

Part II Optional Group 1
Please select 15 credits from the following:

If you are selecting from the FREE, UOSM or LANG electives modules, you must ensure that your choice is from Semester 1.

A maximum of 15 credits in any level NQF5 module in subject MATH.
A maximum of 15 credits in any level NQF5 module in subject UOSM.

FREE XY15 Part 2 Elective
LANGXX15 Language Module

Code	Module Title	ECTS	Type
MATH2003	Group Theory	7.5	Optional
MANG1003	Introduction to Management	7.5	Optional
MATH3087	Maths and your Future	7.5	Optional

Part II Optional Group 2
Please select 15 credits from the following:

If you are selecting from the FREE, UOSM or LANG electives modules, you must ensure that your choice is from Semester 1.

A maximum of 15 credits in any level NQF5 module in subject MATH.
A maximum of 15 credits in any level NQF5 module in subject UOSM.

Code	Module Title	ECTS	Type
ECON2004	Topics in Macroeconomics 2	7.5	Optional

Part III

Part III Compulsory

Code	Module Title	ECTS	Type
MATH3017	Mathematical Programming	7.5	Compulsory

Part III Optional Rule 0
You must select 1 module (15 Credits) from the list below.

If you took MATH3087 and do not wish to take one of the other modules listed below, please contact your student office. You may not select MATH3087 if you have previously taken it in part

Code	Module Title	ECTS	Type
MATH3023	Communicating and Teaching Mathematics	7.5	Compulsory
MATH3032	Mathematical Investigation and Communication	7.5	Compulsory
MATH3031	Mathematics Project	7.5	Compulsory
MATH3087	Maths and your Future	7.5	Compulsory

Part III Optional Rule 1
The option modules shown below constitute an indicative list; there will always be choice but the options might vary between years. A full list of option modules and rules will be available to you via the Student Record Self-Service system once you enrol at the University.

Please select 4 up to a maximum of 7 modules (60 - 105 credits) from the following:
You must take at least 16 MATH modules over Parts 1, 2 and 3, including at least 60 credits of MATH3XXX modules in Part 3 and an even balance of credits across semester 1 and semester 2.
Please Note:- Students who took 90 credits or more MATH modules in Part 2
need to take only 60 credits in Part 3, if this applies to you please contact mathstudentoffice@ soton.ac.uk.'
From Part 3 onwards, it is recommended that you specialise in one of the following areas:-
1. Actuarial & Financial Mathematics
2. Operational Research, Management Sciences & Statistics
3. Mathematics & Statistics
Additionally, there are barred combinations for certain modules as outlined below.
You cannot take MATH6129 if you have taken MATH3063
You cannot take MATH6131 if you have taken MATH2040
You cannot take MATH6143 if you have taken MATH3085
You cannot take MATH6127 if you have taken MATH3022
You cannot take MATH6128 if you have taken MATH2012
You cannot take MATH6130 if you have taken MATH3066

Part III Optional Rule 1 Group 1 Actuarial & Financial Modules
Please select 0 up to a maximum of 6 modules (0 - 90 credits) from the following:

Code	Module Title	ECTS	Type
MATH3063	Actuarial Mathematics I	7.5	Optional
MATH3066	Actuarial Mathematics II	7.5	Optional
MATH3022	Mathematical Finance	7.5	Optional
STAT3010	Statistical Methods in Insurance	7.5	Optional
MATH3085	Survival Models	7.5	Optional
ECON3010	Topics in Macroeconomics 3	7.5	Optional

Part III Optional Rule 1 Group 2 - Op Res, Mgt Sci & Stat Modules
Please select 0 up to a maximum of 7 modules (0 - 105 credits) from the following:

Code	Module Title	ECTS	Type
MATH3014	Design and Analysis of Experiments	7.5	Optional
MATH3033	Graph Theory	7.5	Optional
MANG3010	Knowledge Management	7.5	Optional
MANG3046	Managing Innovation	7.5	Optional
MATH3018	Numerical Methods	7.5	Optional
MATH3016	Optimization	7.5	Optional
MANG3034	Project Management	7.5	Optional
MATH3013	Simulation & Queues	7.5	Optional
MATH3044	Statistical Inference	7.5	Optional
MATH3091	Statistical Modelling II	7.5	Optional

Part III Optional Rule 1 Group 3 - Maths and Statistics Modules
Please select 0 up to a maximum of 6 modules (0 - 105 credits) from the following:

You may not select MATH3033 if you have already selected it from Group 2

Code	Module Title	ECTS	Type
MATH3072	Advanced Fluid Dynamics	7.5	Optional
MATH3083	Advanced Partial Differential Equations	7.5	Optional
MATH3080	Algebraic Topology	7.5	Optional
MATH3088	Complex Analysis	7.5	Optional
MATH3078	Further Number Theory	7.5	Optional
MATH3086	Galois Theory	7.5	Optional
MATH3033	Graph Theory	7.5	Optional
MATH3076	Hilbert Spaces	7.5	Optional
MATH3084	Integral Transform Methods	7.5	Optional
MATH3052	Mathematical Biology	7.5	Optional
MATH3006	Relativity, Black Holes and Cosmology	7.5	Optional
MATH3090	Structure and Dynamics of Networks	7.5	Optional

Part III Optional Rule 1 Group 4 Additional Optional Modules
Please select 0 up to a maximum of 4 modules (0 - 60 credits) from the following:

Code	Module Title	ECTS	Type
MATH3023	Communicating and Teaching Mathematics	7.5	Optional
MATH3089	Mathematics for the Modern World	7.5	Optional
MATH3031	Mathematics Project	7.5	Optional
MATH3087	Maths and your Future	7.5	Optional

Part III Optional Rule 2
Select 3 modules (45 credits) from the following groups:

Part III Optional Rule 2 Group 1
Select 0 modules (0 credits) up to a maximum of 1 module (15 credits) from the following:-

Note: you are permitted to only `backtrack' once to take a Part 2 module.

Please note you cannot take MATH2049 Geometry and Topology if you have previously taken MATH2046.

Must take 0 credits up to a maximum of 15 credits from the following:

FREEXY15 Part 2 Elective
15 credits in any level NQF5 module in subject MATH
A maximum of 15 credits in any level NQF5 module in subject UOSM.

Code	Module Title	ECTS	Type
MANG2014	Accounting and Finance for Non-Specialists	7.5	Optional

Part III Optional Rule 2 Group 2
Select up to 3 modules (45 credits).
Select 2 modules (30 credits) up to a maximum of 3 modules (45 credits) from the following.

Only 1 non-Math module may be taken this year in either semester 1 or semester 2.
+ FREEXZ15 - Part 3 Elective Module (15 credits)
+ LANGXX15 - Language Module (15 credits)
+ LANGXX30 - Language Module (30 credits)

A Maximum of 15 credits in any level NQF6 module in subject MATH

Code	Module Title	ECTS	Type
MANG3020	Futures and Options	7.5	Optional
MANG3009	International Banking	7.5	Optional
MANG3046	Managing Innovation	7.5	Optional
MANG3034	Project Management	7.5	Optional
STAT3010	Statistical Methods in Insurance	7.5	Optional
ECON3010	Topics in Macroeconomics 3	7.5	Optional

Part IV

Part IV Compulsory

Code	Module Title	ECTS	Type
MATH6144	MMath Project	15	Compulsory

Part IV Optional Modules Rule 1
When making your choices you should ensure an even balance of credits across semester 1 and semester 2.
From Part 3 onwards, it is recommended that you specialise in one of the following areas:-
Group 1. Actuarial & Financial Mathematics
Group 2. Operational Research, Management Sciences & Statistics
A suggested collection of optional modules which may be taken in each of these three areas is outlined in the programme specification, but other options are allowed with approval of the Programme Director.
Additionally, there are barred combinations for certain modules as outlined below.
You cannot take MATH6129 if you have taken MATH3063
You cannot take MATH6131 if you have taken MATH2040
You cannot take MATH6143 if you have taken MATH3085
You cannot take MATH6127 if you have taken MATH3022
You cannot take MATH6128 if you have taken MATH2012

Part IV Optional Modules Rule 1 Group 1 Actuarial & Fin Maths Modules
Please select 0 - 6 modules (0 - 90 credits) from the following:

Code	Module Title	ECTS	Type
MANG6225	Accounting and Finance for Actuarial Science	7.5	Optional
MATH6129	Actuarial Mathematics I	7.5	Optional
MATH6130	Actuarial Mathematics II	7.5	Optional
MANG6022	Corporate Finance 1	7.5	Optional
ECON6015	Finance	5	Optional
MATH6131	Financial Mathematics	7.5	Optional
MANG6020	Financial Risk Management	7.5	Optional
ECON6016	International Trade	5	Optional
ECON6023	Macroeconomics	10	Optional
ECON6023	Macroeconomics	10	Optional
MATH6127	Mathematical Finance	7.5	Optional
ECON6021	Microeconomics	10	Optional
MANG6008	Quantitative Research in Finance	7.5	Optional

Part IV Optional Modules Rule 1 Group 2 Op Res, Mgt Sci & Stat Modules
Please select 0 - 6 modules (0 - 90 credits) from the following:

Code	Module Title	ECTS	Type
MATH6112	Computer-based statistical modelling	3.75	Optional
MATH6027	Design of Experiments	7.5	Optional
MANG6100	Game Theory for Business	3.75	Optional
ECON6008	Industrial Economics	5	Optional
ECON6004	Quantitative Methods	10	Optional
MANG6231	Software for Data Analysis and Modelling	3.75	Optional
MATH6128	Stochastic Processes	7.5	Optional

Progression Requirements

The programme follows the University's regulations for ***Progression, Determination and Classification of Results : Undergraduate and Integrated Masters Programmes*** or ***Progression, Determination and***

Classification of Results: Postgraduate Master's Programmes. Any exemptions or variations to the University regulations, approved by AQSC are located in ***section VI of the University Calendar***.

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-ordinator 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 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 evaluation questionnaires for each module of the programme.
- Acting as a student representative on various committees, e.g. Staff/Student Liaison Committees, School 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.

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

Career Opportunities

Employability is embedded into modules from the first year onwards and right from the first lecture. We explain the degree skills which are taught throughout the modules and offer a number of optional employability modules.

We place great importance on the development of graduate skills vital for future employment by adding transferable skills into learning and teaching.

Our degrees are a passport to vocational and non-vocational careers alike, with recent graduates employed in roles ranging from actuaries and statisticians to crime analysts and medical researchers.

External Examiner(s) for the programme

Name: Mr Neil Mcconville – Queen's University Belfast

Name: Dr Thomas Mohaupt – University of Liverpool

Name: Professor Jeremy Oakley – University of Sheffield

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 they take 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
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 models are Casio FX-570 and Casio FX-85GT Plus. These may be purchased from any source and no longer need to carry the University logo.
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. For students undertaking modules with a high mathematical content, some assessed work will be submitted in handwritten hard copy format. Students are advised that they will need to bear the costs of the required stationery.
Software Licenses	The software required for the programme is available on all public workstations on campus, and accessible from your own computer via VPN.
Stationery	You will be expected to provide your own day-to-day stationery 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.

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***.