Programme Specification

Actuarial Science (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	1
Accreditation details	Institute and Faculty of Actuaries
Final award	Master of Science (MSc)
Name of Award	Actuarial Science
Interim Exit awards	Postgraduate Certificate Postgraduate Diploma
FHEQ level of final award	Level 7
UCAS code	
Programme Code	4738
QAA Subject Benchmark or other external reference	Mathematics, Statistics And Operational Research 2007
Programme Lead	Erengul Dodd
Pathway Lead	

Programme Overview

Brief outline of the programme

This postgraduate degree programme is designed to provide quantitative graduates with the opportunity to undertake an intensive and coherent programme of specialist education in actuarial science, to gain exemptions from certain of the professional examinations of the Institute and Faculty of Actuaries, the UK professional actuarial body, and to thereby enable graduates of the programme to subsequently enter employment as actuarial analysts with advanced professional standing.

The following table displays the exemption mapping between Institute and Faculty of Actuaries professional Subjects and taught modules, together with corresponding module weightings.

CT Subject
Professional Subject | University Module | Weighting
CT1 Financial Mathematics | MATH6131 Financial Mathematics | 100%
CT2 Finance and Financial Reporting | MANG6225 Accounting and Finance for Actuarial Science | 100%
CT3 Probability and Mathematical Statistics | MATH6122 Probability and Mathematical Statistics | 100%
CT4 Models | MATH6143 Survival Models | 50%
CT4 Models | MATH6128 Stochastic Processes | 50%
CT5 Contingencies | MATH6129 Actuarial Mathematics I | 50%
CT5 Contingencies | MATH6130 Actuarial Mathematics II | 50%
CT6 Statistical Methods| STAT6075 Statistical Methods in Insurance | 100%
CT7 Business Economics | MATH6121 Economics | 100%
CT8 Financial Economics | MATH6127 Mathematical Finance | 100%

C2019 Subject
Professional Subject | University Module | Weighting
CS1 | MATH6122 Probability and Mathematical Statistics |70%
CS1 | STAT6075A Statistical Methods in Insurance | 30%
CS2 | MATH6128 Stochastic Processes | 25%
CS2 | MATH6143 Survival Models | 25%
CS2 | STAT6075 Statistical Methods in Insurance | 50%
CS1+2 | MATH6122 Probability and Mathematical Statistics | 35%
CS1+2 | MATH6128 Stochastic Processes | 12.50%
CS1+2 | MATH6143 Survival Models | 12.50%
CS1+2 | STAT6075 Statistical Methods in Insurance | 40%
CM1 | MATH6129 Actuarial Mathematics I | 50%
CM1 | MATH6130A Actuarial Mathematics II | 15%
CM1 | MATH6131A Financial Mathematics | 35%
CM2 | MATH6127 Mathematical Finance | 65%
CM2 | MATH6130B Actuarial Mathematics II | 20%
CM2 | MATH6131B Financial Mathematics | 15%
CM1+2 | MATH6127 Mathematical Finance | 32.50%
CM1+2 | MATH6129 Actuarial Mathematics I | 25%
CM1+2 | MATH6130 Actuarial Mathematics II | 17.50%
CM1+2 | MATH6131 Financial Mathematics | 25%
CB1 | MANG6225 Accounting and Finance for Actuarial Science | 100%
CB2 | MATH6121 Economics |100%

Notes

MATH6130A is the part of MATH6130 that pertains to CM1
MATH6130B is the part of MATH6130 that pertains to CM2
MATH6131A is the part of MATH6131 that pertains to CM1
MATH6131B is the part of MATH6131 that pertains to CM2
STAT6075A is the part of STAT6075 that pertains to CS1
STAT6075B is the part of STAT6075 that pertains to CS2

Please Note: New students entering from September 2019 will, depending on academic performance, be eligible for exemption from the C2019 Core Principles Subjects CS1, CS2, CM1, CM2, CB1, and CB2, whereas existing students from previous entry cohorts will, depending on academic performance, continue to be eligible for exemption from the Core Technical Subjects CT1-CT8 (these exemptions will be mapped to corresponding C2019 Core Principles Subjects by the IFoA, post graduation, according to their transition rules).

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 programme is taught through a mixture of lectures, tutorials, problem classes, computer workshops, case studies and project work.

Assessment
Assessment is through examinations, coursework assignments, including class tests, and case study reports or project dissertation.

Special Features of the programme

N/A

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:

1. Introduce you to the theoretical concepts, methods, and techniques of actuarial science;
2. Develop your understanding of practical actuarial, statistical and financial modelling and of the context in which such work is undertaken;
3. Offer you the opportunity to study actuarial topics selected from a range of options, but within a coherent framework;
4. Give you sufficient grounding in actuarial science for employment as an actuarial analyst;
5. Offer you the opportunity to gain exemptions from corresponding professional examinations of the Institute and Faculty of Actuaries;
6. Provide you with the opportunity to gain practical experience of applying problem-solving and other skills learned by working on actuarial science case studies or an actuarial science project;
7. Help you to develop subject specific and key transferable skills: personal organisation, problem solving, logical argument, deductive reasoning and analysis, abstraction and generalisation, locating, retrieving, synthesising 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. The theoretical concepts, methods, and techniques of actuarial science;
A2. Actuarial, statistical and financial modelling, including practical limitations and assumptions;
A3. The context in which actuarial work is undertaken;
A4. The aspects of economics and accounting and finance of importance for actuarial science;
A5. Techniques of risk management in an actuarial context;
A6. Communication in an actuarial context;
A7. Actuarial investigation planning, information retrieval, data collection, analysis and reporting.

Teaching and Learning Methods

The programme outcomes have been developed with reference to the professional syllabi of the Institute and Faculty of Actuaries. Acquisition of knowledge and understanding of A1 through A7 is through structured exposition based on lectures, tutorial or problem classes, case studies, supervised project work, and private study, as appropriate. Having successfully completed Part 1 of this programme you will be able to demonstrate knowledge and understanding of A1 - A5. Having successfully completed Part 2 of this programme you will, in addition, be able to demonstrate knowledge and understanding of A6 and A7. Part 1 of this programme is mapped to A1 - A5 and Part 2 will provide you addition with A6 and A7.

Assessment Methods

Every module is assessed, typically by a combination of unseen examinations and coursework, including class tests. This variety of assessment relates to A1 through A7.

Subject Specific Intellectual and Research Skills

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

B1. Logically analyse and critically evaluate the appropriateness and applicability of the concepts, methods, and techniques of actuarial science;
B2. Structure and analyse actuarial problems;
B3. Construct, analyse, and interpret appropriate actuarial, statistical, and financial models in an actuarial context;
B4. Assess the role and impact of economics and accounting and finance in an actuarial context;
B5. Assess risk and apply an appropriate risk management strategy and associated techniques in an actuarial context;
B6. Logically discuss and communicate actuarial concepts and analyses, both orally and in written form; plan and analyse an actuarial investigation.

Teaching and Learning Methods

The application, analysis, critical evaluation, and interpretation of actuarial, statistical, and financial models are fundamental to actuarial science, and are emphasised throughout the teaching and learning experience. The fundamental role played by risk and the need to assess and manage risk in an actuarial context is also emphasised throughout. Planning, analysis, and logical communication skills are further developed through the actuarial science case studies or actuarial science project.

Assessment Methods

The various methods of assessment involve analysis, problem solving, modelling, and critical evaluation, in addition to the assessment of knowledge, technical ability, and understanding. For the actuarial science case studies or actuarial science project, planning, analysis, and communication are assessed through the resulting reports or dissertation.

Transferable and Generic Skills

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

C1. Personal organisation and time management;
C2. Problem solving, logical argument, deductive reasoning and analysis, abstraction and generalisation;
C3. Locating, retrieving, synthesising, and using information, particularly through use of the library and the web;
C4. Written and oral communication; independent learning.

Teaching and Learning Methods

A variety of teaching and learning methods is used, appropriate to the learning outcomes as described above. During the actuarial science case studies or actuarial science project, skills such as library and web research, time management, and communication are developed further. A formal library skills training session, report/dissertation writing preparation session, and R statistical software workshops form part of the preparation for the actuarial science case studies or actuarial science project.

Assessment Methods

Throughout the programme, problem solving, deductive reasoning and analysis, and communication form an essential part of the assessment criteria employed, either explicitly or implicitly. For some elements of coursework and for the actuarial science case studies or actuarial science project, a proportion of the assessment is related to communication, and, where relevant, to the appropriate use of library and web research.

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

Part 1 Structure (9 Months: October – mid June)

Modules are chosen from offerings below (each 7.5 ECTS/15 CATS) to total at least 60 ECTS/120 CATS points. Up to 15 ECTS/30 CATS may be chosen from approved alternative modules in related cognate areas, subject to agreement with the Programme Director. Choice of modules is dependent on entering knowledge, professional examination passes, or exemptions.

Part 1 of the programme is taught full time over nine months. The taught modules of the programme are delivered over the first nine months, which is divided into two semesters. Each semester is of 14 weeks' duration. The final two weeks of each semester are set aside for examinations.

In the week before the first semester begins, you will attend induction events, which provide you with orientation, an introduction to the University facilities, and an introduction to the programme itself.

Each taught module requires attendance at a specified number of 45-minute lectures, tutorials, and/or problem classes. Each taught module is worth 7.5 ECTS/15 CATS.

You are required to register for, attend, and be assessed in taught modules worth at least 60 ECTS/120 CATS in total. Your final assessment for Part 1 of the programme will be based on the taught modules totalling 60 ECTS/120 CATS in which your performance was best.

Part 2 Structure (Additional 3 Months: mid-June – mid-September)

There are then two distinct routes that you can take over the summer:

Route 1: The first option is that you may undertake MATH6159 Actuarial Science Case Study 1 over the first six weeks of the summer period (typically, mid-June until end-July) followed by MATH6160 Actuarial Science Case Study 2 over the second six weeks of the summer period (typically, start-August until mid-September). There will normally be a choice of two investigation topics for each case study. For each of your chosen case study topics, you will be assigned a supervisor and must complete and be assessed in a report (of 25-30 pages) that describes the investigation undertaken. Each report should be submitted at the end of the relevant six-week period. MATH6159 Actuarial Science Case Study 1 is worth 15 ECTS/30 CATS and MATH6160 Actuarial Science Case Study 2 is worth 15 ECTS/30 CATS.

Route 2: The second option is that you may undertake MATH6132 Actuarial Science Project over the thirteen-week summer period (typically, mid-June until mid-September). The availability of this option is conditional on the suitability and feasibility of the investigation formally proposed by the student, and the availability of suitable supervision resource. You will be assigned a supervisor and must complete and be assessed in a dissertation (of 50-60 pages) that describes the investigation undertaken. The dissertation should be submitted at the end of the thirteen-week period. MATH6132 Actuarial Science Project is worth 30 ECTS/60 CATS.

The progression and classification rules for this programme follow University regulations. Links to the specific details of the progression rules, including compensation for failed modules and referral arrangements, are contained in the Programme Handbook.

Given the nature of the programme as described above, there are no core or compulsory modules in Part 1. However, MATH6159 Actuarial Science Case Study 1 and MATH6160 Actuarial Science Case Study 2, or, alternatively, MATH6132 Actuarial Science Project, are core for the MSc.

Students who take MATH6159 Actuarial Science Case Study 1 and MATH6160 Actuarial Science Case Study 2 will have one opportunity for resubmission of the corresponding reports, should this be required. A student who passes one case study module but fails the other will be required to resubmit only in the failed module. Students taking MATH6132 Actuarial Science Project will have one opportunity for resubmission of the corresponding dissertation, should this be required.

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 options. Against each year, you are directed to which modules are compulsory and which are options. The option modules listed constitute an indicative list. There will always be choice but the options might vary between years. A complete list of option modules currently available on your programme can be found via the Student Record Self-Service system.

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

The programme is normally studied over one year full-time. The taught component of the programme (Part 1) consists of 30 study weeks divided into two semesters during which time students study at least eight modules (60 ECTS/120 CATS). It is possible for students to take an additional module each semester i.e. a total of 75 ECTS/ 150 CATS across the whole of Part 1. If students wish to gain exemption from all C2019 Core Principles Subjects CS1, CS2, CM1, CM2, CB1, CB2 (or Core Technical Subjects CT1-CT8, depending on the entrance year), they must take all 10 modules. However only their performance in their best 8 Part 1 modules contributes to the calculation of their degree award.
You will then undertake a three-month period of supervised actuarial investigation (Part 2), resulting in corresponding reports/dissertation at a value of 30 ECTS/60 CATS).

Part I Option - Rule 0
You may choose to take MATH6132 MSc Actuarial Science Project (60 credits) instead of MATH6159 and MATH6160. Please note however, that the availability of MATH6132 is conditional on
the suitability and feasibility of the investigation formally proposed by the student, and the

availability of suitable supervision resource. If you wish to choose MATH6132 you should first gain approval from the programme lead and then submit a module change form to the Student Office.
You may select MATH6132 OR MATH6159 and MATH6160
These modules will become core once chosen.

Code	Module Title	ECTS	Type
MATH6159	Actuarial Science Case Study 1	15	Optional/Core
MATH6160	Actuarial Science Case Study 2	15	Optional/Core
MATH6132	MSc Actuarial Science Project	30	Optional/Core

Part I Option - Rule 1
You should select a minimum of 4 modules (60 credits) up to a maximum of 5 modules (75 credits) from the following list.
In addition, it may be possible for you to replace one of the modules on this list with another module relevant to actuarial science. You may only do this subject to timetabling constraints and with the permission of your Programme Director.

Code	Module Title	ECTS	Type
MATH6129	Actuarial Mathematics I	7.5	Optional
MATH6121	Economics	7.5	Optional
MATH6131	Financial Mathematics	7.5	Optional
MATH6122	Probability and Mathematical Statistics	7.5	Optional
MATH6143	Survival Models	7.5	Optional

Part I Option - Rule 2
You should select a minimum of 4 modules (60 credits) up to a maximum of 5 modules (75 credits) from the following list.
In addition, it may be possible for you to replace one of the modules on this list with another module relevant to actuarial science. You may only do this subject to timetabling constraints and with the permission of your Programme Director.

Code	Module Title	ECTS	Type
MANG6225	Accounting and Finance for Actuarial Science	7.5	Optional
MATH6130	Actuarial Mathematics II	7.5	Optional
MATH6127	Mathematical Finance	7.5	Optional
STAT6075	Statistical Methods in Insurance	7.5	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 leads' support. Module leads will be available either at designated times during the week (for example, during their published office hours) or by appointment 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.
· Senior Tutor. The Senior Tutor will also 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 profiles. These will be available at the start of each module (often in online format). These include the aims and learning outcomes of the module, the methods of assessment, the syllabus and 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

Actuaries are highly skilled quantitative professionals who are primarily concerned with the identification, quantification, analysis, and management of various types of risk, particularly those with long term financial consequences. Their expertise is essential to the proper management of life, general, and health insurance companies, pension funds, and investment firms, and their skills are very highly regarded and valued throughout the financial services industry. This programme provides you with a professional level education in actuarial science that is sufficient for employment as an actuarial analyst. The programme is designed to enable you to select options from a range of actuarial topics, according to your individual preferences and past actuarial experience, where relevant. All of the actuarial topics available correspond to professional Subjects of the Institute and Faculty of Actuaries. New students entering from September 2019 will, depending on academic performance, be eligible for exemption from the C2019 Core Principles Subjects CS1, CS2, CM1, CM2, CB1, and CB2, whereas existing students from previous entry cohorts will, depending on academic performance, continue to be eligible for exemption from the Core Technical Subjects CT1-CT8 (these exemptions will be mapped to corresponding C2019 Core Principles Subjects by the IFoA, post graduation, according to their transition rules). Graduates of the programme with several professional examination exemptions are well-placed to enter employment as actuarial analysts with advanced professional standing. As a student on the programme, you will also develop key transferable skills, such as time management and personal organisation, use of the library and the web for information location and retrieval, and written and oral communication.

External Examiner(s) for the programme

Name: Mr Neil McConville - Queens University Belfast

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 model is Casio FX-570 This may be purchased from any source and no longer needs to carry the University logo.
Printing and Photocopying Costs	In some cases, coursework submissions, such as essays, projects, and reports/dissertations, are likely to be submitted online. Students may also be required to provide a printed copy. For the MSc actuarial science case studies or actuarial science project, two bound printed copies of each report/dissertation must be submitted, in addition to submission online. A list of the University printing costs can be found here: https://www.southampton.ac.uk/isolutions/services/copying_for_students_and_visitors/faq.php#594
Professional exams	Students who perform sufficiently well in relevant modules will receive recommendation for exemption from the corresponding professional exams of the Institute and Faculty of Actuaries (IFoA), at no cost to the student. Graduates who subsequently decide to join the IFoA and claim these exemptions must pay the relevant fees to the IFoA, details of which may be found here: http://www.actuaries.org.uk
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 or required 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 may suggest certain 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 these 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***.