

PROGRAMME SPECIFICATION

KEY FACTS

Programme name	Actuarial Science
Award	MSc
School	Cass Business School
Department or equivalent	Specialist Masters Programme
Programme code	PSACSM
Type of study	Full Time
Total UK credits	180
Total ECTS	90

PROGRAMME SUMMARY

The MSc in Actuarial Science programme consists of two stages.

Stage 1: Core Statistics, Core Mathematics, Core Business, Business Analytics modules

Successful completion of Stage 1 requires achieving 120 credits from Core Statistics, Core Mathematics, Core Business and Business Analytics modules.

You have to pass the compulsory modules:

- SMM061 Financial Mathematics (CM1(1) – 20 credits)
- SMM047 Probability and Mathematical Statistics (CS1 – 30 credits)
- SMM065 Contingencies (CM1(2) – 30 credits)

Additionally, you will need to obtain at least 40 more credits from the elective modules:

- SMM062 Finance and Financial Reporting (CB1 – 20 credits)
- SMM071 Business Economics (CB2 – 20 credits)
- SMM045 Modelling (CS2(1) – 25 credits)
- SMM044 Statistical Methods (CS2(2) – 25 credits)
- SMM068 Financial Economics (CM2 – 30 credits)
- SMM634 Analytics Methods for Business (15 credits)*
- SMM636 Machine Learning (15 credits)*

Please note that CM1(1) and CM1(2) together make up the professional subject CM1; similarly, CS2(1) and CS2(2) together make up the professional subject CS2. If you already have an exemption from one or both of the professional exams CM1 and CS1 corresponding to compulsory modules, either through taking a professional examination or through prior study, you may be allowed to not take this particular module as part of your MSc in Actuarial Science at Cass. In that case, you will still need to obtain the corresponding credits from different Core Statistics, Core Mathematics, Core Business

and Business Analytics modules. Please note that SMM634 and SMM636 do not offer any exemption, but are intended to offer an alternative practical computer-based experience in analytics tasks.

*** Pre requisites: if you wish to take either or both of these modules you will also need to take the online programming modules in R and Python.**

Stage 2: Research Methods for Actuarial Professionals / Short Electives / Applied Research Project (optional) / Business Research Project (optional)

To complete Stage 2 you need to be awarded 60 further credits from:

- SMM540 Research Methods for Actuarial Professionals (10 credits), and EITHER 5 short elective modules (10 credits each), OR 1 short elective module (10 credits) and SMM527 Business Research Project (40 credits), OR 3 short elective modules (10 credits each) and SMM799 Applied Research Project (20 credits)

Successful completion of both Stages 1 and 2 leads to the award of the MSc in Actuarial Science (180 credits). Please note that, depending on your choice of modules, you may accumulate more than 180 credits. However, your final award will be calculated from 180 credits only.

Terms 1, 2 and 3

Modules CM1(1), CS1, CB1 and CB2 are taught in term 1 and written exams are held in January. Modules CM1(2), CM2, CS2(1) and CS2(2) are taught in term 2 and written exams are held in late April / early May. Modules SMM634 and SMM636 are taught in term 2 and are assessed only by coursework.

Research Methods for Actuarial Professionals is taught in term 1.

Short elective modules are taught in term 3. The Applied Research Project starts in term 3 and extends to the end of August as does the Business Research Project.

The MSc in Actuarial Science is only available for study on a full-time basis.

The aims of the programme are:

1. To give you the opportunity to study the fundamentals of actuarial science, statistics, finance and economics, corresponding to subjects CM1, CM2, CS1, CS2, CB1 and CB2 of the Actuarial Profession's examinations, and to enable you to gain exemption from them.

2. To give you the opportunity to additionally study business analytical methods and learn how data analysis is performed in the real world, corresponding to module SMM634.
3. To give you the opportunity to additionally study machine learning techniques and their use in analysing complex data and designing predictive analytics methods, corresponding to module SMM636.
4. To prepare you for employment in actuarial and related fields.
5. To provide you with opportunities for additional study beyond the core syllabus, to enable you to be better prepared both for practical actuarial work and also for tackling the later professional examinations.
6. To be a suitable preparation for students wishing to proceed to the MSc in Actuarial Management, and for those students wishing to pursue relevant academic research.
7. To develop your abilities for independent research.
8. To enable you to develop your own interests in the field of actuarial science, and enable you to prepare for further professional education and for employment in actuarial professional practice or research.

Throughout the course, where possible, lecturers will emphasise the many ethical issues that arise in the context of actuarial practice. In so doing, you will be encouraged to share your views with your lecturers and with your classmates, where a diversity of opinion is to be expected and encouraged.

Please note that the postgraduate certificate and postgraduate diploma are Exit Awards only and are awarded to students who do not meet the standard for the award of an MSc, but do meet the standard for the award of credit required for the lesser award.

Postgraduate Certificate

Following the award of a Postgraduate Certificate in Actuarial Science you will be able to examine the theories related to all aspects of Actuarial Science and apply your learning in the appropriate context. You will possess the skills and knowledge required to develop a career in Actuarial Science and you will have mastered essential skills and knowledge and developed an appreciation of what it takes to undertake professional actuarial roles. The assessments you undertake to achieve this qualification will focus on the skills, knowledge and attributes that you will need to facilitate your career development and will support you in developing your practical abilities. The postgraduate certificate will enable you to gain confidence in your role and skills.

Postgraduate Diploma

Following the award of a Postgraduate Diploma Actuarial Science in addition to the above you will gain a more advanced knowledge and in-depth understanding of these subject areas, from a variety of different perspectives and in order for you to broaden your expertise and skills. You will have developed a sophisticated appreciation of current requirements in the actuarial field, together with the ability to evaluate a range of different approaches to them.

MSc

Following successful completion of the MSc in Actuarial Science you will have the ability to plan and evaluate all aspects of Actuarial Science and apply your learning in the appropriate context. You will also have demonstrated the capacity to expand your knowledge and build on the core of your degree through engagement with specialist elective topics or your own, independently researched project.

WHAT WILL I BE EXPECTED TO ACHIEVE?

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

Knowledge and understanding

- Summarise and critically assess fundamental concepts in statistics, economics, finance, investment and business.
- Recognise and apply actuarial theory used in investment, insurance and probability modelling.
- Evaluate a specific area of actuarial theory or practice and apply this in a detailed and systematic way.

Skills

- Manage time effectively to cope with intensive study.
- Demonstrate proficiency in the use of actuarial and statistical methods to solve insurance, investment and analytics problems.
- Demonstrate advanced mathematical and analytical problem-solving skills.
- Use software as an effective tool for data analysis and financial modelling.
- Evaluate and apply alternative approaches in the analysis of financial reports.
- Present reasoned arguments demonstrating specialised knowledge.
- Communicate effectively with academic and professional tutors in written reports.
- Develop reasoned arguments on current issues relating to actuarial theory and practice.
- Evaluate research papers and professional texts to produce an independent synthesis of knowledge and ideas.
- Demonstrate the ability to evaluate and synthesise information and ideas from articles in actuarial journals.

Values and attitudes

- Reflect on the professional and public service values of the Actuarial Profession.

This programme has been developed in accordance with the QAA Subject Benchmark for Mathematics, Statistics and Operational Research.

HOW WILL I LEARN?

The teaching and learning methods used on the programme consist of:

1. An intensive schedule of lectures
2. Additional online lectures in certain modules
3. Additional tutorial classes in certain modules
4. Extensive private study based on approved reading, question sheets and other lecture handouts
5. Class discussion, tests and other interactive teaching methods during lectures
6. Computer-based work on software
7. Private study of professional and academic literature
8. Training in research methods
9. Meetings with a Business Research Project supervisor

The MSc in Actuarial Science is designed and structured to allow for intellectual progression through core modules taught in terms 1 and 2. Modules taught in term 2 normally build on the knowledge and skill acquired in term 1. Term 3 allows for further progression by choosing specialist elective modules or a dissertation/project, where students can apply knowledge and skills acquired earlier in the programme.

A minimum of 10 teaching and learning hours (both contact and non-contact) are required for each credit awarded. The precise weighting of different types of teaching and learning depends on the modules you take and the breakdown is therefore provided within the appropriate module specifications.

Non-contact hours are for self-directed study and account for the minimum amount of time you should spend studying independently, including subject research, reading, working in groups and completing assignments and other homework.

Overall teaching and learning hours: approx. 1800 hours

Contact hours: approx. 258 hours

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessment and Assessment Criteria

The assessment methods used on the programme consist of:

1. Closed-book examinations
2. Coursework with and without computer-based components
3. Tests (both in class and online)
4. Online quizzes
5. Presentations
6. Writing research project reports

Detailed assessment criteria are available in your handbook and from your individual module leaders.

Assessment Criteria are descriptions, based on the intended learning outcomes, of the skills, knowledge or attitudes that you need to demonstrate in order to complete an assessment successfully, providing a mechanism by which the quality of an assessment can be measured. Grade-Related Criteria are descriptions of the level of skills, knowledge or attributes that you need to demonstrate in order to achieve a certain grade or mark in an assessment, providing a mechanism by which the quality of an assessment can be measured and placed within the overall set of marks.

Assessment Criteria and Grade-Related Criteria will be made available to you to support you in completing assessments. These may be provided in programme handbooks, module specifications, on the virtual learning environment or attached to a specific assessment task.

Feedback on assessment

Feedback will be provided in line with our Assessment and Feedback Policy and will be provided in a variety of ways throughout your course, both formally and informally, in order to support your learning.

You will normally be provided with coursework feedback within three weeks of the submission deadline or assessment date. This would normally include a provisional grade or mark. The timescale for feedback on final projects or dissertations may be longer. Examination grades will be provided once they have been agreed by an Assessment Board.

More details about the feedback you can expect from individual modules and assessments will be provided by your lecturers.

The full policy can be found at:

https://www.city.ac.uk/_data/assets/pdf_file/0008/68921/assessment_and_feedback_policy.pdf

Assessment Regulations

In order to pass your programme, you should complete successfully or be exempted from the relevant modules and assessments and, therefore, acquire the required number of credits. The programme is weighted according to the number of credits awarded for each module. Pass / Fail modules are excluded from this calculation.

The pass mark for each module is 50% and there are no minimum qualifying marks for individual components.

If you fail an assessment component or a module, the following will apply:

1. Compensation: where you fail up to a total of 20 credits at first or resit attempt (15 for a postgraduate certificate), you may be allowed compensation if:
 - Compensation is permitted for the module involved (see the “What will I Study” section of the programme specification), and
 - It can be demonstrated that you have satisfied all the Learning Outcomes of the modules in the Programme, and
 - A minimum overall mark of no more than 10% below the module pass mark has been achieved in the module to be compensated, and
 - An aggregate mark of 50% has been achieved overall.

Where you are eligible for compensation at the first attempt, this will be applied in the first instance rather than offering a resit opportunity.

If you receive a compensated pass in a module, you will be awarded the credit for that module. The original component marks will be retained in the record of marks and your original mark shall be used for the purpose of your award calculation.

If you are awarded the MSc with compensation, you will be eligible for subject by subject exemptions.

2. Re-Sit: where you are not eligible for compensation at the first attempt you will normally be offered one re-sit attempt.

If you are successful in the re-sit, you will be awarded the credit for that module. The mark for each assessment component that is subject to a re-sit will be capped at the pass mark for the module. This capped mark will be used in the calculation of the final module mark together with the original marks for the component(s) that you passed at first attempt.

If you do not meet the pass requirements for a module and do not complete your re-sit by the date specified, you will not progress and the Assessment Board will require that you be withdrawn from the programme.

If you fail to meet the requirements for the Programme, the Assessment Board will consider whether you are eligible for an Exit Award as per the table below.

To be awarded a Postgraduate Diploma you need to achieve at least 120 credits from modules in terms 1, 2 and 3, which must include:

- SMM061 – Financial Mathematics (CM1(1) – 20 credits)
- SMM047 – Probability and Mathematical Statistics (CS1 – 30 credits)
- SMM065 – Contingencies (CM1(2) – 30 credits)

To be awarded a Postgraduate Certificate you need to achieve at least 60 credits from modules in terms one, two and three.

If you fail to meet the requirements for the programme and are not eligible for the award of a lower qualification, the Assessment Board shall require that you withdraw from the programme.

If you would like to know more about the way in which assessment works at City, please see the full version of the Assessment Regulations at:

http://www.city.ac.uk/_data/assets/word_doc/0003/69249/s19.doc

WHAT AWARD CAN I GET?

Masters Degree

	HE Level	Credits	Weighting (%)
Degree	7	180	100

Class	% required
With Distinction	70
With Merit	65
Without classification	50

Postgraduate Diploma

Students must achieve 120 credits, including SMM061, SMM047 and SMM065, with a minimum mark of 50%.

	HE Level	Credits	Weighting (%)
Degree	7	120	100

Class	% required
With Distinction	70
With Merit	65
With Pass	50

Postgraduate Certificate

Students must achieve 60 credits, with a minimum mark of 50%.

	HE Level	Credits	Weighting (%)	Class	% required
Degree	7	60	100	With Distinction	70
				With Merit	65
				Without classification	50

WHAT WILL I STUDY?

The modules forming part of the MSc in Actuarial Science are the following.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be Compensated?	Level
Financial Mathematics (Subject CM1(1))	SMM061	20	C	Y	7
Probability and Mathematical Statistics (Subject CS1)	SMM047	30	C	N	7
Contingencies (Subject CM1(2))	SMM065	30	C	N	7
Finance and Financial Reporting (Subject CB1)	SMM062	20	E	Y	7
Modelling (Subject CS2(1))	SMM045	25	E	N	7
Statistical Methods (Subject CS2(2))	SMM044	25	E	N	7
Financial Economics (Subject CM2)	SMM068	30	E	N	7
Business Economics (Subject CB2)	SMM071	20	E	Y	7
Analytics Methods for Business	SMM634	15	E	Y	7
Machine Learning	SMM636	15	E	Y	7
Research Methods for Actuarial Professionals	SMM540	10	C	Y	7
Business Research Project	SMM527	40	E	N	7
Applied Research Project	SMM799	20	E	N	7
Modelling and Data Analysis	SMM069	10	E	Y	7
Topics in Quantitative Risk Management	SMM070	10	E	Y	7
Alternative Risk Transfer and Risk Securitisation	SMM382	10	E	Y	7
Ethics, Society and the	SMM500	10	E	Y	7

Financial Sector					
Hedge Funds	SMM121	10	E	Y	7
Mergers & Acquisitions	SMM233	10	E	Y	7
Intro to Python	SMM283	10	E	Y	7
Technical Analysis and Trading Systems	SMM529	10	E	Y	7

During term three you will be able to choose from a range of electives to personalise your experience.

This list of electives is an indication of the range of modules that can be on offer and is subject to change due to circumstances such as: enhancing or updating the quality and content of educational provision; responding to student feedback; academic staffing changes; the number of students in each programme; lack of student demand for certain modules; or factors beyond the institution's reasonable control, such as meeting the latest requirements of a commissioning or accrediting body. For these reasons, not all the electives listed will be offered every year. New (additional or replacement) modules may also be added for these reasons.

There may also be prerequisites for joining a module, and space and timetable availability restrictions may also apply.

The list of electives offered in a given year will be confirmed by February 1st.

TO WHAT KIND OF CAREER MIGHT I GO ON?

There is a continuous demand for capable postgraduate level executives in the Actuarial Profession. They work in fields such as insurance companies (life/non-life), consulting firms, government departments, banks and investment firms, teaching and research.

<http://www.cass.city.ac.uk/more-about-cass/careers-services> - Careers Service

<https://community.city.ac.uk/cass/home-> Alumni Service

WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?

Placements are not part of the programme.

WILL I GET ANY PROFESSIONAL RECOGNITION?

Accrediting Body: Actuarial Profession

Nature of Accreditation

This programme is accredited by the Actuarial Profession in the United Kingdom. The Profession appoints an Independent Examiner, who recommends students on this programme for exemptions from professional examinations, provided that they have achieved the necessary standard.

Exemptions may be awarded in relation to professional subjects CM1, CM2, CS1, CS2, CB1 and CB2.

HOW DO I ENTER THE PROGRAMME?

To be accepted on to a Cass MSc degree you will need a good Bachelors degree. This usually means a UK 2.1 or above, or the equivalent from an overseas institution. Some level of previous study in the specific subject area may be required.

Applicants will need to submit two references, one of which must be an academic reference if the candidate does not have previous work experience. Previous work experience is not a requirement of our full-time MSc courses.

We require all students who have not previously studied in English to take an IELTS exam. The IELTS requirement is 7.0 with a minimum of 6.5 in writing.

There is no direct admission to the Graduate Diploma in Actuarial Science, which is a compensatory award for the students admitted to the MSc in Actuarial Science.

The MSc in Actuarial Science is only available for study on a full-time basis.

RPL/RP(E)L Requirements

Applicants with prior exemptions in one or both of CM1 and CS1, corresponding to compulsory modules on MSc in Actuarial Science, may be allowed to not take those modules for which prior exemptions are held. However, the corresponding number of credits needs to be obtained through passing other elective Core Statistics, Core Mathematics and Core Business modules.

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For use from: 2019-20