



PROGRAMME SPECIFICATION

KEY FACTS

Programme name	Actuarial Science
Award	MSc
Exit Awards	PG Dip, PG Cert
School	Bayes Business School
Department or equivalent	Specialist Masters Programme
Programme code	PSACSM
Type of study	Full Time
Total UK credits	180
Total ECTS	90
Mode of learning	In person

PROGRAMME SUMMARY

The MSc Actuarial Science programme consists of two stages.

Stage 1

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

You will have to pass the compulsory modules:

- BBM008 Financial Mathematics (CM1(1)) (15 credits)
- SMM065 Contingencies (CM1(2)) (30 credits)

Additionally, you will need to obtain at least 75 more credits from the elective modules:

- BBM009 Finance and Financial Reporting (CB1) (15 credits)
- BBM010 Business Economics (CB2) (15 credits)
- SMM047 Probability and Mathematical Statistics (CS1) (30 credits)
- SMM048 Insurance Risk Modelling (CS2) (30 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. If you already have an exemption from CM1 corresponding to compulsory modules BBM008 and SMM065 on the programme, either through taking a professional examination or through prior study, you may be allowed to not take these modules. 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 also note that SMM634 and SMM636 do not offer any exemption.

Throughout your degree, you will integrate your learning across a range of professional skills, delivered in a highly targeted and applied format. These skills are aimed at helping you develop your aspirations, plan your approach to your job search and help you create a strong base from which to manage your career long term. You will also be able to use the skills you learn to support your wider study, substantiate your arguments and make informed assessments about the material you are covering.

*** Prerequisites: note that in order to be allowed to take any of SMM634 and SMM636, you first need to pass the SMM693 Introduction to R Programming module by a pre-specified deadline.**

Stage 2

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

EITHER

Option 1 - Elective study only: taking 5 x specialist electives of 10 credits each plus BBM109 Career Management Skills and Research Management(10 credits).

OR

Option 2- a combination of elective study (3 x 10 credits) and a General Research Project (1 x 30 credits)

OR

- **Option 3** - SMM092 Modelling Practice (CP2) (15 credits), SMM091 Professional Communication (CP3) (15 credits), 2 short elective modules (10 credits each), plus BBM109 Career Management Skills and Research Management

OR

- **Option 4** - SMM092 Modelling Practice (CP2) (15 credits), SMM091 Professional Communication (CP3) (15 credits) and a General Research Project (30 credits).

Successful completion of both Stages 1 and 2 leads to the award of the MSc Actuarial

Science (180 credits). Please note that, depending on your choice of modules in Stage 1, you may accumulate more than 180 credits overall. However, your final award will be calculated from 180 credits only.

MSc Actuarial Science with Business Analytics

Students who choose to take both SMM634 and SMM636 and at least two of SMM284, SMM694 and SMM695 in Term 3, subject to passing the required prerequisites SMM692 and SMM693, will be entered to MSc Actuarial Science with Business Analytics. Please refer to the relevant programme specification for more details.

Aims of the programme

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 Institute and Faculty of Actuaries' examinations, and to enable you to gain exemption from them.
2. To give you the opportunity to study the modelling and communication practices, corresponding to subjects CP2 and CP3 of the Institute and Faculty of Actuaries' examinations, and gain exemptions from them.
3. 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.
4. 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.
5. To prepare you for employment in actuarial and non-traditional related fields.
6. To provide you with opportunities for additional study beyond the professional syllabus, to enable you to be better prepared both for practical actuarial work and also for tackling the later professional examinations.
7. To be a suitable preparation for students wishing to proceed to the MSc Actuarial Management, and for those students wishing to pursue relevant academic research.
8. To develop your abilities for independent research.
9. 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.

Registration Period

It is expected that you will complete this degree within 12 months. The maximum period of registration for the degree is three years full time.

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.
- 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.
- Present reasoned arguments demonstrating specialised knowledge.

Graduate Attributes

The graduate attributes you can demonstrate on completion of your programme are key to your future employment. It is therefore central to every programme that there will be opportunities in the learning, teaching and assessment activities for you to engage with these on all modules. Further detail of this will be provided for you by your module leader. The graduate attributes are:

- Always learning
- Engaged in the world
- Technical and digital
- Connected Professional

HOW WILL I LEARN?

A range of learning and teaching strategies are used to meet different learning outcomes and to cater for the varied backgrounds of the students. Specific learning and teaching strategies, such as lectures and guided reading, are adopted for students to achieve an understanding of the current level of knowledge in the sphere of actuarial science.

In addition, case studies, real-life exercises and contributions from industry specialists are used to achieve integration between theory and practice. Students work both in small groups to benefit from peer interaction and carry out pieces of individual work. The research projects provide students with the opportunity to acquire research and report-writing skills on an individual basis.

Coursework provides on-going feedback on students' progress. Tests assess knowledge gained. Examinations are used to assess both the knowledge gained at an in-depth level and problem-solving ability.

The MSc Actuarial Science is designed and structured to allow for intellectual progression through 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 by building on Core Principles to develop modelling and communication practices, or by choosing a dissertation/project, where students can apply knowledge and skills acquired earlier in the programme.

An indicative number of learning and teaching hours (normally around 10, both contact and non-contact) are required for each credit awarded. The precise weighting of different types of learning and teaching 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 indicative amount of time you should spend studying independently, including subject research, reading, working in groups and completing assignments and other homework.

Overall learning and teaching hours: approx. 1800 hours

Contact hours: approx. 280 hours (depending on module choices)

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessment and Assessment Criteria

The assessment methods used on the programme consist of a variety of different formats and will depend on your choice of modules. Assessment formats may include examinations, tests and quizzes, written assignments and presentations, set exercises or computer-based exercises, and may also include a formal research project.

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/about/governance/policies/student-policies-and-regulations>

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. Re-Sit:

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.

2. Compensation:

Compensation can only be awarded by the Final Assessment Board and must be applied within the following limits and conditions:

Where you fail up to a total of 30 credits (15 for a postgraduate certificate), you may be eligible for 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.

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, at the point where you have results for all taught modules:

- You have no more than 30 credits outstanding (15 for a PG Certificate), and
- The grade for this module(s) is 40% or above, and
- Your overall degree average is at least 50%, and
- If the module(s) is eligible for compensation.

Then you will **not** be required to undertake the re-sit for that module, as this will be eligible for compensation.

Please note:

- **If you fail more than 30 credits (excluding project modules), then you must retake all outstanding assessments with no exceptions.**

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.

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.

To be awarded a Postgraduate Diploma you need to achieve at least 120 credits from modules in Terms 1, 2 and 3.

To be awarded a Postgraduate Certificate you need to achieve at least 60 credits from modules in Terms 1, 2 and 3.

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](http://www.city.ac.uk/data/assets/word_doc/0003/69249/s19.doc)

WHAT AWARD CAN I GET?

Master's Degree

Following successful completion of the MSc Actuarial Science you will have the ability to plan and evaluate all aspects of actuarial science including non-traditional fields, such as business analytics, 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.

	HE Level	Credits	Weighting (%)
Degree	7	180	100

Class **% required**

With Distinction	70
With Merit	65
Without classification	50

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.

Students must achieve 120 credits, 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

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 including non-traditional fields, such as business analytics, 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.

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 Actuarial Science are the following.

Module Title	SITS Code	Module Credits	Compulsory / Elective	Can be Compensated?	Level
Financial Mathematics (Subject CM1(1))	BBM008	15	C	Y	7
Contingencies (Subject CM1(2))	SMM065	30	C	N	7
Probability and Mathematical Statistics (Subject CS1)	SMM047	30	E	N	7
Finance and Financial Reporting (Subject CB1)	BBM009	15	E	Y	7
Business Economics (Subject CB2)	BBM010	15	E	Y	7
Insurance Risk Modelling (Subject CS2)	SMM048	30	E	N	7
Financial Economics (Subject CM2)	SMM068	30	E	N	7
Analytics Methods for Business	SMM634	15	E	Y	7
Machine Learning	SMM636	15	E	Y	7
Term Three					
Modelling Practice (CP2)	SMM092	15	E	Y	7
Professional Communication (CP3)	SMM091	15	E	Y	7
Career Management Skills and Research Management	BBM109	10	E	Y	7
General Research Project	BBM110	30	E	N	7

Advanced Predictive Analytics	SMM069	10	E	Y	7
Applied Machine Learning*	SMM284	10	E	Y	7
Applied Natural Language Processing*	SMM694	10	E	Y	7
Data Management Systems*	SMM695	10	E	Y	7
Emerging Global Risks	SMM925	10	E	Y	7
Stochastic Claims Reserving in General Insurance	SMM025	10	E	Y	7
Topics in Quantitative Risk Management	SMM070	10	E	Y	7
Financial Crime	SMM739	10	E	Y	7
Financial Statement Analysis & Valuation in Banks	SMM468	10	E	Y	7
Fintech	SMM391	10	E	Y	7
Ethics, Society and the Financial Sector	SMM500	10	E	Y	7

*** Prerequisites:** note that in order to be allowed to take any of these three modules, you first need to pass both modules SMM693 Introduction to R Programming and SMM692 Introduction to Python Programming by a pre-specified deadline.

During Term 3 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.

<https://www.city.ac.uk/careers/your-career>- Careers Service

WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?

Placements are not part of the programme.

WILL I GET ANY PROFESSIONAL RECOGNITION?

Accrediting Body: Institute and Faculty of Actuaries

Nature of Accreditation

This programme is accredited by the Institute and Faculty of Actuaries 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, CB2 (as well as CP2 and CP3).

HOW DO I ENTER THE PROGRAMME?

To be accepted on to a Bayes MSc degree you will need a good Bachelor's 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.

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

RPL/RP(E)L Requirements

Applicants with a prior exemption in CM1, corresponding to compulsory modules on the programme, may be allowed to not take these 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, Core Business and Business

Analytics modules.

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For use from: 2025/26