



## PROGRAMME SPECIFICATION – UNDERGRADUATE PROGRAMMES

### KEY FACTS

Programme name	Actuarial Science Actuarial Science (with Professional Placement)
Award	BSc (Hons)
School	Bayes Business School
Department or equivalent	UG Programme (Bayes Business School)
UCAS Code	G322 Actuarial Science G321 Actuarial Science (with Professional Placement)
Programme code	USACTS
Type of study	Full Time
Total UK credits	450
Total ECTS	225
Partners	Beijing Normal University
Type of partnership	Articulation

### PROGRAMME SUMMARY

The BSc (Hons) Actuarial Science degree gives a sound education in mathematics, statistics and actuarial science. You will also gain skills and knowledge in the key areas of probability theory, economics, accounting and computing. The majority of the modules in the first two years are compulsory, while in the final year there are a number of optional modules to choose from, allowing you to tailor your degree to your strengths and future job requirements.

This is a three year programme (or four years, if a sandwich year is taken or you apply for the programme with an integrated Professional Placement).

If you apply for the four year with Professional Placement programme you will need to secure a Professional Placement between years 2 and 3. If you do not secure a Placement you will be transferred to the BSc Actuarial Science programme.

Bayes is one of very few business schools in the City of London. Our close links with international corporations are reflected in all our degree programmes, which are constantly evolving to meet the needs of an ever-changing business world.

Many of our lecturers are qualified actuaries and have worked in industry and continue to consult for corporate organisations, so you will benefit from their first-hand knowledge and business experience. As we place a high value on teaching both theory

and application, you will emerge from your degree with a good understanding of how to use your newly acquired knowledge in the workplace, whether this concerns a career as an actuary or an alternative direction (such as, for example, risk manager).

Thanks to the academic rigour, the programme also enables some students to further their studies after graduation through a postgraduate degree, such as Actuarial Management at Bayes.

In line with City, University of London's Employability Development Plan, you are expected to gain practical experience with an employer as part of your undergraduate degree. You can gain this experience through a placement where you work for a period with an employer or through taking one or more modules which are delivered in conjunction with an employer. You should take this requirement into account in choosing which elective modules to take and whether to include a placement within your studies.

Indicative modules and other ways to provide the practical experience would be

BM2104 Micro-Placement  
MS2203 Mentoring and Coaching for Leadership  
Professional Placement Year

### Aims

1. To develop a good knowledge and understanding of actuarial science, statistics, mathematics, finance and related disciplines.
2. To develop the ability to communicate your knowledge and understanding accurately.
3. To develop learners' understanding of the respective roles of mathematical and statistical calculation, analysis and judgement in actuarial science.
4. To develop the ability to make reasoned judgements, frame appropriate questions and draw independent conclusions.
5. To equip you with the skills required to work professionally as an actuary or in alternative fields related to statistics, finance and in business more generally.
6. To prepare you to enter postgraduate study in actuarial science or related disciplines.
7. To develop responsible and socially aware actuaries, as many of the decisions that you will make in your career will affect numerous stakeholders all of whose views and situations must be taken into account.

On successful completion of Programme Stage 1 of the Programme you will have acquired a foundational knowledge and understanding of the key concepts and principles underlying your area of study, the ability to recognize and explain these, and to identify and apply appropriate solutions when presented with a problem. On successful completion of Programme Stage 1 you will be eligible for the award of Certificate of Higher Education should you choose to leave the Programme.

On successful completion of Programme Stage 2 of the Programme you will have built on the knowledge and understanding gained at Programme Stage 1 and demonstrated an ability to analyse and apply these concepts and principles to complex problems and scenarios. You will have also have broadened their field of study through the completion of elective modules. On successful completion of Programme Stage 2 you will be eligible for the award of Diploma of Higher Education should you choose to leave the Programme.

On successful completion of Programme Stage 3 of the Programme you will have consolidated the knowledge and understanding gained at Programme Stages 1 and 2 and demonstrate a systematic understanding of key aspects of your field of study. You will have demonstrated an ability to devise and sustain arguments, and/or solve problems, utilising the ideas and techniques you have acquired; and employ established techniques of analysis and enquiry within your discipline. You will have demonstrated independent study skills and research methods. On successful completion of Programme Stage 3 you will be eligible for the award of Bachelor of Science in Actuarial Science.

When you undertake a programme of study at Bayes Business School we will expect you not only to learn but also to challenge and look critically at the world in which we live. We will constantly ask you to question the ethical underpinning of the assumptions you have made and the decisions you have reached, and that inquisitive, ethical approach is woven through every element of a Bayes education. In recognition Bayes is one of the few business schools to have been awarded Champion Status by the UN PRME ( Principles of Responsible Management Education) initiative at Davos in 2018

## **WHAT WILL I BE EXPECTED TO ACHIEVE?**

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

### Knowledge and understanding:

- Recognise and apply core mathematical, statistical and actuarial concepts and principles, including calculus, linear algebra, differential equations and computing
- Recognise and critically evaluate the role of an actuary in a commercial or regulatory organisation
- Select, critique and operate specialist information and concepts in actuarial science, statistics, finance or business
- Identify and critically appraise the role, usage and implications of assumptions, be able to identify them where used and analyse the consequence of their violation.
- Use and critically analyse modelling, modelling techniques, and their conditions and limitations

### Skills:

- Devise and sustain rational arguments and analyse the arguments of others.
- Use calculation and manipulation in the core mathematical, statistical and actuarial subjects

- Identify, select and undertake critical analysis of information from a number of sources (This skill will in particular be assessed in the individual project.)
- Develop and produce on an extended task under guidance.
- Make use of IT as appropriate to perform tasks such as statistical analysis.
- Communicate and discuss results or findings clearly, both orally and in writing.
- Operate as part of a group

#### Values and attitudes:

- Reflect on the importance of an ethical approach to work to a professional actuary
- Practise openness in your calculations and maintain clear documentation of your computational work, to allow for verification by your peers
- Demonstrate tolerance of disagreement when cooperating with others during group work
- Practise sensitivity and tolerance in your dealings with others
- Value diversity in cultures and people
- Manage your time effectively

This programme has been developed in accordance with the QAA Subject Benchmark for both finance and mathematics, statistics and operational research.

#### **HOW WILL I LEARN?**

Teaching and Learning methods are designed to foster your knowledge of and enthusiasm for the subject and stimulate engagement and participation in the learning process. They encourage deep learning and encourage you to reflect on and take responsibility for your own learning and to develop your academic self-confidence.

- Lectures provide knowledge and set the context for your private study. This could, for example, be through question and answer sessions, examples, case studies, discussions and (short) exercises. Most contact hours during the degree programme take the form of lectures.

-Tutorials, exercise classes and surgery hours are opportunities to apply the knowledge and to participate in the discussion of the subject area. The main purpose of exercise classes is to give you practice at solving problems, with tutors on hand to help you if you get stuck. Surgery hours have been scheduled if you are having difficulties with the module concerned. A number of tutorials, exercise classes and surgery hours are scheduled during the first year, these serve to help scaffold your

learning and develop you as an independent learner. The number of tutorials, exercise classes and surgery hours decreases as you progress and you become more able to direct your own learning.

-In several modules, the face-to-face teaching is complemented by online lectures and an active use of the Virtual Learning Environment. This will vary by module but may take the form of delivery of learning materials and resources, submission and feedback of coursework assessments, on-line lecture delivery, discussion forums, question-and-answer sessions or sample/mock questions and quizzes to help you prepare for assessments.

## **WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?**

### Assessment and Assessment Criteria

Assessment is carried out according to context and purpose and recognises that you may exhibit different aptitudes in different forms of assessment:

- Some assessment is by coursework which you take home and complete with the aid of your notes.
- There are formal unseen written examinations every year. They take place at the end of each term (or at the end of a year, if a module is taught over two terms).
- Some assessment takes the form of class tests.
- Some assessment takes the form of online quizzes and tests, using the Virtual Learning Environment.
- A small number of modules require you to give a presentation.
- A group project forms the basis of assessment in one compulsory module and some electives.
- An individual project forms an integral part of the Programme Stage 3 assessment.

Assessment takes an overall view of your achievements. A level of success in each individual module that is commensurate with the overall performance is not necessarily required.

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 on all assessed work (either formative or summative) and on other relevant aspects of your performance and progress in a module. In accordance with the University policy, you will normally be provided with feedback within three weeks of the submission deadline or assessment date. This will normally include a provisional grade or mark. For end of module examinations, or an equivalent significant task (e.g. an

end of module project), feedback will normally be provided when results are released following the Assessment Board.

### Assessment Regulations

In order to pass your Programme, you should complete successfully or be exempted from the relevant modules and assessments and will therefore acquire the required number of credits. You also need to pass each Programme Stage of your Programme in order to progress to the following Programme Stage.

To qualify for the Honours Degree, you must acquire the total credits indicated in the Student Handbook. Calculation of results and classification of the final award is based on a weighted average of module marks. The contribution of each module is proportional to its credit value.

BSc degrees are awarded with First Class Honours, Second Class Honours (Upper and Lower) or Third Class Honours.

The overall class of honours awarded is based on the overall weighted average mark achieved throughout the Programme Stages of your degree. The weights given to each Programme Stage are shown below:

Programme Stage	Weight
One	10%
Two	30%
Three	60%

For students admitted directly to Programme Stage 2 the weights are:

Programme Stage	Weight
Two	40%
Three	60%

### **Progression from Programme Stage 1 to Programme Stage 2**

To be admitted to Programme Stage 2 it is necessary to achieve:

- A module mark of at least 40% in each module, and
- 150 credits at Programme Stage 1.

### **Progression from Programme Stage 2 to Programme Stage 3**

To be admitted to Programme Stage 3 it is necessary to achieve:

- A module mark of at least 40% in each module\*, and
- 150 credits at Programme Stage 2.

\*for module AS2205 Contingencies, you are required to pass the coursework and examination assessment components separately with a mark of 40%.

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

### **1. Compensation**

## **Compensation at Programme Stages 1 & 2**

Where you fail up to a total of one sixth of the total credits of Programme Stages 1 or 2 at first or resit attempt, 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 Stage, and
- A minimum overall mark of 30% has been achieved in the module to be compensated, including a minimum of 30% in the exam and 30% in the coursework, and
- An aggregate mark of 40% has been achieved for the Programme Stage.

## **Compensation at Programme Stage 3**

Once 90 credits have been earned, the remaining credits for Programme Stage 3 can be earned either by passing modules or through compensation provided that:

- 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 Stage, and
- A minimum overall mark of 30% has been achieved in each module to be compensated, and
- An aggregate mark of 40% has been achieved for Programme Stage 3.

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 module mark will be used for the purpose of your Award calculation.

## **2. Resit**

Where you are not eligible for compensation at the first attempt, you will be offered one resit attempt.

If you are successful in the resit, you will be awarded the credit for that module. The mark for each assessment component that is subject to a resit 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 components that you passed at first attempt.

If you do not meet the pass requirements for a module and do not complete your resit by the date specified you will not progress to the next Programme Stage and the Assessment Board will require you to be withdrawn from the Programme.

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

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?

### Bachelor's Degree with Honours:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	150	10
2	5	150	30
3	6	150	60

### **Class**                      **% required**

I	70
II upper division	60
II lower division	50
III	40

### Ordinary Degree:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	150	10
2	5	150	30
3	6	60	60

### **Class**                      **% required**

With Distinction	70
With Merit	60
Without classification	40

### Diploma of Higher Education:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	150	35
2	5	150	65

### **Class**                      **% required**

With Distinction	70
With Merit	60
Without classification	40

### Certificate of Higher Education:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	150	100

### **Class**                      **% required**

With Distinction	70
With Merit	60
Without classification	40

For students admitted directly to Programme Stage 2, the following alternative tables apply:

### Bachelor's Degree with Honours:

Programme Stage	HE Level	Credits	Weighting (%)
2	5	150	40
3	6	150	60

### **Class**                      **% required**

I	70
II upper division	60
II lower division	50
III	40



### Ordinary Degree:

Programme Stage	HE Level	Credits	Weighting (%)
2	5	150	40
3	6	60	60

Class	% required
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With Distinction	70
With Merit	60
Without classification	40

### Diploma of Higher Education:

Programme Stage	HE Level	Credits	Weighting (%)
2	5	150	100

Class	% required
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With Distinction	70
With Merit	60
Without classification	40

### **Why so many credits?**

Most degree programmes require students to achieve 120 credits per year, or the equivalent. It would be possible to deliver a degree which covers the professional subjects of the Institute and Faculty of Actuaries within these constraints, but there would be no space for elective modules, which most students find to be a particularly valuable source of breadth in their education. Electives also give you a flavour of alternative career paths if you decide you do not want to become a fully qualified actuary. The reason for the larger number of credits on BSc Actuarial Science is therefore the broadening of your education and the opportunity to explore a range of possible career options.

## **WHAT WILL I STUDY?**

### Programme Stage 1

Programme Stage 1, which is worth 150 credits, provides a grounding in mathematics, statistics, computing, financial mathematics and economics. All modules are compulsory.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
Introduction to Actuarial Methods and Career Planning	AS1003	15	C	Y	4
Mathematics for Actuarial Science	AS1056	25	C	Y	4
Introduction to Economics (Actuarial Science)	AS1057	30	C	N	4
Probability and Statistics I	AS1101	25	C	Y	4
Financial and Investment Mathematics	AS1201	30	C	N	4
Introduction to Excel and Statistical Packages	AS1104	10	C	Y	4

Introduction to VBA for Excel	AS1202	15	C	Y	4
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## Programme Stage 2

At Programme Stage 2, which is worth 150 credits, the statistical and actuarial subjects are further developed along with the mathematical skills required to master the applications-oriented material at Programme Stages 2 & 3. Students seeking exemption from the maximum number of professional examinations will take Financial Economics and two other electives.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
Actuarial Practicality	AS2001	10	C	Y	5
Calculus and Linear Algebra (Maths 2)	AS2052	15	C	Y	5
Probability & Statistics 2	AS2110	30	C	N	5
Stochastic Models	AS2111	20	C	Y	5
Contingencies	AS2205	15	C	Y	5
Fundamentals of Finance	AS2114	15	C	Y	5
Financial Reporting	AS2207	15	E	Y	5
Mentoring & Coaching	MS2203	15	E	Y	5
Corporate Risk Management	FR2105	15	E	Y	5
Decision Analysis	AS2021	15	E	Y	5
Python, R and Data Structures	AS2113	15	E	Y	5
Python, R and Databases	AS2208	15	E	Y	5
Derivatives, Trading & Hedging	FR2211	15	E	Y	5
Financial Economics	AS2109	15	E	Y	5
Risk Analysis and Modelling	FR2208	15	E	Y	5
Financial Econometrics	FR2107	15	E	Y	5
Micro-Placements	BM2104	15	E	Y	5

## Programme Stage 3

The core actuarial and statistical subjects are compulsory, as is the Final Year Project. Students also choose four from a wide range of electives to make up the remainder of Programme Stage 3. At least two of the four electives must have an AS prefix.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
Final Year Project - BSc Actuarial Science	AS3001	20	C	N	6
Advanced Contingencies	AS3210	15	C	Y	6
Probabilistic Modelling	AS3209	20	C	Y	6
Statistical Modelling	AS3110	15	C	Y	6
Survival Models	AS3204	20	C	Y	6

Extreme Event Statistics	AS3015	15	E	Y	6
Operational Research	AS3021	15	E	Y	6
Advanced Financial Economics	AS3109	15	E	Y	6
Investment	AS3301	15	E	Y	6
General Insurance	AS3303	15	E	Y	6
Pensions and Other Benefits	AS3304	15	E	Y	6
Fixed Income Portfolio Management	FR3100	15	E	Y	6
Asset-Liability Management	FR3102	15	E	Y	6
Technical Analysis	FR3110	15	E	Y	6
Real Estate Finance and Funding	FR3202	15	E	Y	6
Advanced Econometrics and Forecasting	IF3103	15	E	Y	6
Statistical Reasoning, Communication & Ethics	AS3208	15	E	Y	6
Game Theory	MA3662	15	E	Y	6
Advanced Management Practice	BM3200	15	E	Y	6
Integrated Professional Training	IF3112	15	E	Y	6
Summer Internship	IF3113	15	E	Y	6
Financial Technology	AS3025	15	E	Y	6

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; a 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.

The list of electives offered in a given year will be confirmed by 1<sup>st</sup> September.

Certain electives may be pre-requisites for other electives you may wish to take later in the programme. Full details can be found in the individual Module Specifications and will be updated annually in your Course Handbook.

In view of the importance of foreign language skills and employability, you also have the opportunity to study extra-curricular (non-credit bearing) language courses in Arabic, French, German, Mandarin, Russian and Spanish.

### **TO WHAT KIND OF CAREER MIGHT I GO ON?**

The majority of graduates become actuarial trainees and study for the Institute and Faculty of Actuaries' examinations; qualified actuaries typically work in pensions, insurance and risk management. Others embark on careers in investment banking and investment management, or in accountancy, commercial banking, financial engineering

and financial analysis. Some enter careers in management consultancy, management, computing and teaching, whilst others progress to postgraduate study, often on our MSc in Actuarial Management.

If you would like more information on the Careers support available at City, please go to: <http://www.city.ac.uk/careers/for-students-and-recent-graduates>.

### **WHAT STUDY ABROAD OPTIONS ARE AVAILABLE?**

If you opt to apply for a sandwich year abroad and are accepted you will study at one of our overseas partner universities in between Stages 2 & 3. You will be required to pass all Programme Stage 2 assessments at the first attempt.

Studying abroad enables you to improve your language skills, develop future business contacts and provides you with an international outlook on business.

### **WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?**

#### Professional Work Placement Option

Programme Details: The Professional Work Placement programme is a recognised part of your degree, which is endorsed on your final degree certificate. It is undertaken during your 3<sup>rd</sup> year, giving you the opportunity to add a valuable additional year to your degree working for a professional organisation, either in the UK or abroad. You will then return to Bayes, after your Placement, to complete your final year.

The aims of the Professional Work Placement go beyond work experience. You will spend a period of 9 – 12 months within a professional working environment taking on real responsibilities whilst receiving a competitive salary. This option is intended to give you practical experience which can be related to the knowledge gained at University and is greatly valued by graduate employers. You also get the opportunity to explore the industry you would like to enter after graduation. You will develop key personal, transferable and professional skills, along with the added possibility of securing a graduate position on completing your placement.

Eligibility: You are required to pass all of your Year 2 assessments at the first attempt. However, students not meeting this requirement will be considered on a case by case basis.

#### Summer Internships:

Taken at the end of your 2nd Year for a period of 4 – 12 weeks, this is a great opportunity to gain vocationally relevant work experience within a professional organisation. On completion of your internship you will receive a 'Certificate of Professional Experience'

Eligibility: No requirements

In addition BSc Actuarial Science students are invited to participate in the Careers Service Micro-Placements scheme. See <http://www.city.ac.uk/careers/city-opportunities/the-micro-placement-programme> for full details of the scheme and how to apply.

### **WILL I GET ANY PROFESSIONAL RECOGNITION?**

**Accrediting Body:** Institute and Faculty of Actuaries

### **Nature of Accreditation**

Specific modules in all 3 years earn exemptions from 6 of the 13 professional subjects of the Institute and Faculty of Actuaries.

Performance in particular groups of modules qualifies Honours graduates for exemption from the Institute and Faculty of Actuaries' examinations.

Subject CS1a: Actuarial Statistics 1 (paper based assessment)

Subject CS1b: Actuarial Statistics 1 (computer based assessment)

Subject CS2a: Actuarial Statistics 2 (paper based assessment)

Subject CS2b: Actuarial Statistics 2 (computer based assessment)

Subject CM1a: Actuarial Mathematics 1 (paper based assessment)

Subject CM1b: Actuarial Mathematics 1 (computer based assessment)

Subject CM2a: Actuarial Mathematics 2 (paper based assessment)

Subject CM2b: Actuarial Mathematics 2 (computer based assessment)

Subject CB1: Business 1 (Business Finance)

Subject CB2: Business 2 (Business Economics)

**Accrediting Body:** Chartered Insurance Institute (CII)

### **Nature of Accreditation**

Upon completion of the degree students will receive a significant number of credits towards the Advanced Diploma in Insurance (290 required for completion) and up to 30 credits to be used towards the Diploma/Advanced Diploma in Financial Planning (credits awarded are dependent on modules chosen).

Please note that recognition of prior learning awards can change at any time in response to qualification framework changes. Any changes will be communicated to you as soon as they are confirmed.

### **HOW DO I ENTER THE PROGRAMME?**

For A-level students our standard offer is A (Maths) AA.

For International Baccalaureate students our standard offer is 36 points overall, including 7 in HL Maths and minimum 5 in all subjects.

We also make offers on other international qualifications that are recognised by British Universities.

For students whose first language is not English, evidence of English language proficiency is required.

IELTS: 6.5 with a minimum of 6 in any unit.

Pearson Academic English: 58 overall with a minimum of 50 in any component

For use from: 2023-24