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	360 480 with Professional Placement
Total ECTS	180 240 with Professional Placement

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.

The programme consists of 3 Programme Stages, or 4 Programme Stages if a sandwich year is taken.

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 actuary or an alternative direction (such as e.g. 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 MSc 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
BM3200 Advanced Management Practice
AS3111 Volunteering and Career Development
AS3112 Integrated Professional Training
AS3113 Summer Internship
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.

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

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.

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 should stimulate enthusiasm. This could e.g. be through question and answers 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 prepare for assessments..

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

<u>Assessment and Assessment Criteria</u>

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 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 three Programme Stages of your degree. The weights given to each Programme Stage are shown below:

BSc Actuarial Science

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

BSc Actuarial Science (with Placement)

Programme Stage	Weight
One	9%
Two	27%
Placement	10%
Three	54%

The Pass mark for each module is 40%.

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
- 120 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
- 120 credits at Programme Stage 2.

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

1. Compensation

Where you fail up to a total of one quarter of the total credits of a Programme Stage 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, and
- An aggregate mark of 40% has been achieved for the Programme Stage.

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

Resits

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.

Resits at Programme Stage 1 or 2

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.

Resits at Programme Stage 3

If you do not meet the pass requirements for a module and do not complete your resit by the date specified you will not be awarded an Honours Degree. Under the Assessment Regulations, if you who fail to achieve 120 credits at Programme Stage 3 (after compensation, if applicable) you will be recommended for an Ordinary Degree, or the lower award of a Diploma or Certificate in Higher Education, provided that you meet the requirements for any of these awards.

If you have Extenuating Circumstances which have been agreed and accepted as valid you will be given the option of resitting any missed examinations at the next available opportunity.

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

WHAT AWARD CAN I GET?

Bachelor's Degree with Honours:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	10
2	5	120	30
3	6	120	60

Class	% required
I	70
II upper division	60
II lower division	50
III	40

Bachelor's Degree with Honours (with Placement):

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	9
2	5	120	27
Placement	6	120	10
3	6	120	54

Class	% required
I	70
II upper division	60
II lower division	50
III	40

Ordinary Degree:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	10
2	5	120	30
3	6	60	60

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

Ordinary Degree (with Placement):

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	9
2	5	120	27
Placement	6	120	10
3	6	60	54

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

Diploma of Higher Education:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	35
2	5	120	65

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

Certificate of Higher Education:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	100

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

WHAT WILL I STUDY?

Programme Stage 1

Programme Stage 1, which is worth 120 credits, provides a grounding in mathematics, statistics, computing and financial mathematics. All modules are compulsory.

Module Title	SITS Code	Module Credits	Core/ Elective/ Compulsory	Can be compen-sated?	Level
Introduction to VBA and Career Planning	AS1006	15	Compulsory	Y	4
Mathematics for Actuarial Science	AS1004	15	Compulsory	Y	4
Probability and Statistics 1 with R [CS1a]	AS1005	30	Core	N	4
Microeconomics for Actuarial Science [CB2a]	AS1105t	15	Compulsory	Y	4
Macroeconomics for Actuarial Science [CB2b]	AS1204	15	Compulsory	Y	4
Financial and Investment Mathematics with Excel [CM1a]	AS1007	30	Core	N	4

Programme Stage 2

At Programme Stage 2, which is worth 120 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 with take Financial Economics and Financial Reporting.

Module Title	SITS Code	Module Credits	Core/ Elective/ Compulsory	Can be compen-sated?	Level
Calculus and Linear Algebra	AS2052	15	Compulsory	Y	5
Probability & Statistics 2 [CS1b]	AS2115	15	Compulsory	Y	5
Mathematical Statistics [CS1c]	AS2209	15	Compulsory	Y	5
Stochastic Models [CS2a]	AS2116	15	Compulsory	Y	5
Contingencies [CM1b]	AS2205	15	Compulsory	Y	5
Fundamentals of Finance [CB1a]	AS2114	15	Compulsory	Y	5
Financial Reporting [CB1b]	AS2207	15	Elective	Y	5
Financial Economics [CM2a]	AS2109	15	Elective	Y	5
Python, R and Data Structures	AS2113	15	Elective	Y	5
Corporate Risk Management	FR2105	15	Elective	Y	5
Decision Analysis	AS2021	15	Elective	Y	5
Derivatives	IF2209	15	Elective	Y	5
Financial Econometrics	FR2202	15	Elective	Y	5
Mentoring and Coaching	MS2203	15	Elective	Y	5

Risk Analysis and Modelling	FR2208	15	Elective	Y	5
Microplacement	BM2104	15	Elective	Y	5

Programme Stage 3

120 credits' worth of modules must be taken. The core statistical subjects are compulsory, as is the Final Year Project. Students also choose three from a range of electives to make up the remainder of Programme Stage 3. A student aiming to maximise the number of exemptions will choose Advanced Financial Economics and Advanced Contingencies.

Module Title	**SITS Code**	**Module Credits**	**Core/ Elective/ Compulsory**	**Can be compen-sated?**	**Level**
Final Year Project - BSc Actuarial Science	AS3002	15	Core	N	6
Probabilistic Modelling [CS2b]	AS3116	15	Compulsory	Y	6
Statistical Modelling [CS1d]	AS3110	15	Compulsory	Y	6
Survival Models [CS2c]	AS3114	15	Compulsory	Y	6
Time Series and Machine Learning [CS2d]	AS3115	15	Compulsory	Y	6
Advanced Contingencies [CM1c]	AS3210	15	Elective	Y	6
Advanced Financial Economics [CM2b]	AS3109	15	Elective	Y	6
Extreme Event Statistics	AS3015	15	Elective	Y	6
Operational Research	AS3021	15	Elective	Y	6
Advanced Financial Forecasting	IF3103	15	Elective	Y	6
Investment	AS3301	15	Elective	Y	6
Fixed Income Portfolio Management	FR3100	15	Elective	Y	6
Asset-Liability Management	FR3102	15	Elective	Y	6
Data Visualisation	AS3027	15	Elective	Y	6
Real Estate Finance and Funding	FR3202	15	Elective	Y	6
Statistical Reasoning, Communication & Ethics	AS3208	15	Elective	Y	6
Advanced Management Practice	BM3200	15	Elective	Y	6
Financial Technology	AS3025	15	Elective	Y	6
Game Theory	MA3662	15	Elective	Y	6
General Insurance	AS3303	15	Elective	Y	6
Integrated Professional Training	AS3112	15	Elective	Y	6
Summer Internship	AS3113	15	Elective	Y	6

Volunteering and Career Development	AS3111	15	Elective	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 1st 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.

TO WHAT KIND OF CAREER MIGHT I GO ON?

The majority of graduates become actuarial trainees and study for the Institute of Actuaries' examinations. Others embark on careers in investment banking and investment management, or in accountancy, commercial banking, insurance and financial analysis. Some enter careers in 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 Years 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?

If you opt to apply for a placement sandwich year between Years 2 & 3 and are accepted, you will be required to pass all Programme Stage 2 assessments at the first attempt. However, if you are referred in a module, then this will be considered on a case-by-case basis. This option enables you to gain the professional skills valued by graduate employers, apply the theory you have studied and to develop a network of contacts.

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

An appropriate level of performance in specific modules in all 3 years earn exemptions from 6 of the examinations of the Institute and Faculty of Actuaries.

Subject CS1: Actuarial Statistics
Subject CS2: Risk Modelling and Survival Analysis
Subject CM1: Actuarial Mathematics
Subject CM2: Financial Engineering and Loss Reserving
Subject CB1: Business Finance
Subject CB2: Business Economics

The list of modules associated with each of these subjects will be found in the Programme Handbook.

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 and a grade 4 at GCSE English Language.

For International Baccalaureate students our standard offer is 35 points overall, including 6 in HL Maths and either HL4 or SL5 in English.

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: 59 overall with a minimum of 59 in any component

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