

**REGULATIONS FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE  
(BSc[ActuarSc])**

*These regulations apply to students admitted in the academic year 2004-2005 or thereafter.*

*(See also General Regulations and Regulations for First Degree Curricula)*

The degree of Bachelor of Science in Actuarial Science is an undergraduate degree, awarded for the satisfactory completion of a prescribed course of specialist training in actuarial science.

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**Definitions**

**AS1<sup>(1)</sup>** In these Regulations, and in the Syllabuses for the degree of BSc(ActuarSc), unless the context otherwise requires —

‘Course’ means a course of instruction which normally carries 6 credits or in some cases 3 credits or multiples of 3, leading to one examination paper as defined in the syllabus;

‘Paper’ means one or more of the following tests: a theoretical examination paper, a practical examination paper, an assessment of field practice, a thesis, and a dissertation, or other assignments as prescribed in the syllabus of the course leading to it;

‘Credits’ means the weight assigned to each course relative to the total study load. The number of credits is indicative of the contact hours and/or study time associated with the course on a weekly basis;

‘Pre-requisite’ means a course which candidates must have completed as specified to the satisfaction of the Head of Department before being permitted to take the course in question.

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**Admission to the degree**

**AS2** To be eligible for admission to the degree of Bachelor of Science in Actuarial Science candidates shall

- (a) comply with the General Regulations;
  - (b) comply with the Regulations for First Degree Curricula; and
  - (c) complete the curriculum in accordance with the regulations that follow.
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**Length of study**

**AS3** The curriculum shall normally extend over three academic years consisting of six semesters of full-time study, excluding the summer semesters. Candidates shall not in any case be permitted to complete the curriculum in more than four academic years, which being the maximum period of registration.

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**Completion of the curriculum**

**AS4** To complete the curriculum, candidates shall:

- (a) satisfy the requirements prescribed in UG3 of the Regulations for First Degree Curricula<sup>(2)</sup>;
  - (b) enrol in not less than 180 credits of courses, unless otherwise required or permitted under the Regulations;
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<sup>(1)</sup> This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

<sup>(2)</sup> The specific requirements applicable to candidates of this degree curriculum are spelt out in the syllabuses.

- (c) follow the required number of compulsory and elective courses as prescribed in the syllabuses of the equivalent of normally 60 credits for each year of study. For each semester, candidates shall select not less than 24 or more than 36 credits of courses, except for the last semester of study;
  - (d) take a maximum of 84 credits of introductory level courses and the rest being advanced level courses as prescribed in the syllabuses over the entire period of studies; and
  - (e) take not less than 84 credits of advanced level courses from the Department of Statistics and Actuarial Science.
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### **Selection of courses**

**AS5** Candidates who wish to withdraw from a course at the beginning of each semester may do so up to 2 weeks after the commencement of the semester. Withdrawal beyond the 2-week deadline will not be permitted, except for medical or other reasons acceptable by the Faculty Board, and candidates' withdrawal from any course without permission will be given a failed grade.

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### **Assessment and grades**

**AS6** Candidates should be assessed for each of the courses which they have registered. The assessment may take one or a combination of forms as prescribed in the syllabuses and shall normally include the candidates' coursework during the semester. Only those satisfactorily completed courses will earn credits.

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**AS7** Candidates' performance in a course shall be assessed with the grading system as prescribed in UG5 of the Regulations for First Degree Curricula.

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### **Failure in examination**

**AS8** Candidates who fail in any course may, as directed by the Board of Examiners, be permitted to present themselves for re-assessment with or without repeating the failed course. The timing and the form(s) of re-assessment shall be decided by the Board of Examiners. Candidates shall not be allowed to repeat a course for which they have achieved a passed grade for upgrading purposes, nor shall they be permitted to repeat a course more than once. The failed grade will be recorded in the official transcripts. The new grade obtained after re-assessment of the same failed course will also be recorded and will replace the previous F grade in the calculation of the weighted grade point averages. As failed courses shall not be credited towards a degree, failed compulsory courses must be re-assessed.

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### **Absence from examination**

**AS9** Candidates who are unable because of their illness to be present for any written examinations may apply for permission to present themselves for a supplementary examination to be held before the beginning of the first semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of absence from any examination. Candidates who fail to satisfy the examiners in one or more papers in such a supplementary examination shall be considered under the provisions made in these Regulations for failure at the first attempt at the examination, except that a further supplementary examination shall not be permitted.

### Performance assessment

**AS10** At the end of each semester, candidates' performance shall be assessed for the purposes of determining

- (a) their eligibility for progression to an award of the degree;
  - (b) their eligibility for the award; or
  - (c) whether they be required to be discontinued from the programme.
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### Progression of studies

**AS11** Candidates shall be permitted to progress if they have:

- (a) not exceeded the maximum period of registration; and
- (b) accumulated not less than 30 credits and attained a GPA of 1.00 or above over the first and second semesters; or
- (c) accumulated not less than 30 credits and attained a GPA of 1.50 or above over the third and fourth semesters; or
- (d) accumulated not less than 30 credits and attained a GPA of 1.50 or above over the fifth and sixth semesters; or
- (e) attained a semester GPA of 1.50 or above at the end of each subsequent semester.

Those who have not been able to fulfill the requirements above shall be recommended for discontinuation from the programme under General Regulation G12.

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### Award of the degree

**AS12** To be eligible for the award of the degree of BSc(ActuarSc), candidates shall have:

- (a) achieved a weighted GPA of 1.00 or above;
  - (b) successfully accumulated a minimum of 180 credits; and
  - (c) satisfied the requirements in UG3 of the Regulations for First Degree Curricula.
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### Degree classification

**AS13** A list shall be published of candidates successful in the examinations for each semester. A list of candidates who have successfully completed all the degree requirements shall be published in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, Pass. The classification of honours shall be determined by the Board of the Faculty at its full discretion by taking the overall performance of candidates and other relevant factors into consideration.

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### Special arrangements for students who take on 6-month (or longer) full time internships:

1. Students should be in full-time status for at least six academic semesters in addition to their internships in order to fulfill the degree requirements.
2. Students should take STAT2813 (Internship in actuarial science) after they come back from internships, and follow the special arrangements specified in the tables below. They should follow these arrangements completely. Special approval will not be granted to any kind of violation.
3. Special attention should be paid if students intend to take on full-time internships in the 2<sup>nd</sup> semester of Year 2 (2<sup>nd</sup> semester of Year 3 respectively). They have to take the courses specified in the table during the 1<sup>st</sup> semester of Year 2 (1<sup>st</sup> semester of Year 3 respectively) before leaving for internships. It is the students' responsibility to ensure that these requirements are fulfilled prior to leaving for internships.

Period of internship	Pre-defined courses to be taken after internship	
1 <sup>st</sup> semester of Year 2	Leave of absence in the 1 <sup>st</sup> semester of Year 2	
	30 cr.	<p>In the 2<sup>nd</sup> semester of Year 2, students should take</p> <ul style="list-style-type: none"> <li>• STAT2813 Internship in Actuarial Science (<i>Yr 2/3</i>) – <i>to replace any 6-credit advanced level course selected from Inter/Intra Faculty courses (Yr 3)</i></li> <li>• STAT3322 Market risk analysis (<i>Yr 3</i>)</li> <li>• 6 credits from List B (<i>Yr 2/3</i>)</li> <li>• 12 credits from General Education/Broadening courses*, including ECEN2802 (<i>Yr 2</i>)</li> </ul>
	30 cr.	<p>In the 1<sup>st</sup> semester of Year 3, students should take</p> <ul style="list-style-type: none"> <li>• STAT2801 Life Contingencies (<i>Yr 2</i>)</li> <li>• STAT2802 Statistical Models (<i>Yr 2</i>)</li> <li>• STAT2803 Stochastic Models (<i>Yr 2</i>)</li> <li>• STAT2820 Introduction to financial derivatives (<i>Yr 2</i>)</li> <li>• STAT2812 Financial economics I (<i>Yr 3</i>) – <i>special approval is needed to take the course since the pre-requisite (STAT1302 or STAT2802) is not met</i></li> </ul>
	30 cr.	<p>In the 2<sup>nd</sup> semester of Year 3, students should take</p> <ul style="list-style-type: none"> <li>• STAT2804 Linear models and forecasting (<i>Yr 2</i>)</li> <li>• STAT3801 Advanced life contingencies (<i>Yr 2</i>)</li> <li>• STAT3810 Risk theory (<i>Yr 2</i>)</li> <li>• STAT3811 Survival Analysis (<i>Yr 3</i>)</li> <li>• STAT3821 Financial economics II (<i>Yr 3</i>)</li> </ul>
30 cr.	<p>In the 1<sup>st</sup> semester of Year 4, students should take</p> <ul style="list-style-type: none"> <li>• STAT2805 Credibility Theory and Loss Distributions (<i>Yr 3</i>)</li> <li>• 6 credits from List B (<i>Yr 2/3</i>)</li> <li>• 18 credits from List C (<i>Yr 3</i>) – <i>6 out of these 18 credits may be taken in the 2<sup>nd</sup> semester of Year 3</i></li> </ul>	

Period of internship	Pre-defined courses to be taken after internship	
2 <sup>nd</sup> semester of Year 2	Leave of absence in the 2 <sup>nd</sup> semester of Year 2	
	30 cr.	<p>In the 1<sup>st</sup> semester of Year 2 (before taking on internships), students should have taken</p> <ul style="list-style-type: none"> <li>• STAT2801 Life Contingencies (<i>Yr 2</i>)</li> <li>• STAT2802 Statistical Models (<i>Yr 2</i>)</li> <li>• STAT2803 Stochastic Models (<i>Yr 2</i>)</li> <li>• STAT2820 Introduction to financial derivatives (<i>Yr 2</i>)</li> <li>• 6 credits from General Education/Broadening courses* (<i>Yr 2</i>)</li> </ul>

	30 cr.	In the 1 <sup>st</sup> semester of Year 3, students should take <ul style="list-style-type: none"> <li>• STAT2805 Credibility Theory and Loss Distributions (<i>Yr 3</i>)</li> <li>• STAT2812 Financial economics I (<i>Yr 3</i>)</li> <li>• STAT2813 Internship in Actuarial Science (<i>Yr 2/3</i>) – <i>to replace any 6-credit advanced level course selected from Inter/Intra Faculty courses (Yr 3)</i></li> <li>• 6 credits from List B (<i>Yr 2/3</i>)</li> <li>• 6 credits from List C (<i>Yr 3</i>)</li> </ul>
	33 cr.	In the 2 <sup>nd</sup> semester of Year 3, students should take <ul style="list-style-type: none"> <li>• STAT2804 Linear models and forecasting (<i>Yr 2</i>)</li> <li>• STAT3801 Advanced life contingencies (<i>Yr 2</i>)</li> <li>• STAT3810 Risk theory (<i>Yr 2</i>)</li> <li>• STAT3821 Financial economics II (<i>Yr 3</i>)</li> <li>• STAT3322 Market risk analysis (<i>Yr 3</i>)</li> <li>• ECEN2802 Advanced English for Science students (<i>Yr 2</i>)</li> </ul>
	27 cr.	In the 1 <sup>st</sup> semester of Year 4, students should take <ul style="list-style-type: none"> <li>• STAT2306 Business logistics (<i>Yr 3</i>) OR STAT3807 Fundamentals of actuarial practice (<i>Yr 3</i>) – <i>to replace STAT3811 Survival analysis (Yr 3)</i></li> <li>• Another 12 credits from List C (<i>Yr 3</i>)</li> <li>• 6 credits from List B (<i>Yr 2/3</i>)</li> <li>• 3 credits from General Education/Broadening courses (<i>Yr 2</i>)</li> </ul>

\* including (i) one 3-credit course selected from “Humanities and Social Sciences studies” and (ii) one 3-credit course selected from “Culture and Value Studies” or any Inter-faculty Electives Course outside BSc(ActuarSc) Syllabus.

Period of internship	Pre-defined courses to be taken after internship	
1 <sup>st</sup> semester of Year 3	Leave of absence in the 1 <sup>st</sup> semester of Year 3	
	30 cr.	In the 2 <sup>nd</sup> semester of Year 3, students should take <ul style="list-style-type: none"> <li>• STAT3811 Survival Analysis</li> <li>• STAT3821 Financial economics II</li> <li>• STAT3322 Market risk analysis</li> <li>• STAT2813 Internship in Actuarial Science – <i>to replace any 6-credit advanced level course selected from Inter/Intra Faculty courses</i></li> <li>• 6 credits from List B</li> </ul>
	30 cr.	In the 1 <sup>st</sup> semester of Year 4, students should take <ul style="list-style-type: none"> <li>• STAT2805 Credibility Theory and Loss Distributions</li> <li>• STAT2812 Financial economics I</li> <li>• 18 credits from List C – <i>6 out of these 18 credits may be taken in the 2<sup>nd</sup> semester of Year 3</i></li> </ul>

Period of internship	Pre-defined courses to be taken after internship	
2 <sup>nd</sup> semester of Year 3	Leave of absence in the 2 <sup>nd</sup> semester of Year 3	
	30 cr.	In 1 <sup>st</sup> semester of the Year 3 (before taking on internships), students should have taken <ul style="list-style-type: none"> <li>• STAT2805 Credibility Theory and Loss Distributions</li> <li>• STAT2812 Financial economics I</li> <li>• 18 credits – <i>to partially fulfill the requirements of 6 credits from List B, 18 credits from List C and any 6-credit advanced level course selected from Inter/Intra Faculty courses, specified in the original final year of study</i></li> </ul>
	30 cr.	In 1 <sup>st</sup> semester of the Year 4, students should take <ul style="list-style-type: none"> <li>• STAT2813 Internship in Actuarial Science</li> <li>• STAT2306 Business Logistics</li> <li>• STAT3807 Fundamentals of Actuarial Practice - <i>the above 3 courses are to replace STAT3811, STAT3821 &amp; STAT3322</i></li> <li>• 12 credits – <i>to fulfill the requirements of 6 credits from List B, 18 credits from List C and any 6-credit advanced level course selected from Inter/Intra Faculty courses, specified in the original final year of study</i></li> </ul>

## SYLLABUSES FOR THE DEGREE OF BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE

*These syllabuses apply to students admitted in the academic year 2007-2008 or thereafter.*

### GENERAL FEATURES

#### 1. Curriculum requirements

Regulations AS1 to AS4 specify the requirements with which candidates have to comply for completion of the BSc(ActuarSc) degree programme. For the fulfillment of Regulation UG3 “Requirements for Graduation”, candidates shall complete successfully the language studies courses and the broadening courses as listed below. Furthermore they should obtain a pass in an Information Technology proficiency test, or successfully complete a 3-credit course in Information Technology.

#### 2. Course registration

Course registration will take place before the commencement of each semester. All introductory level courses should be taken in the first or second semester except those specified in the syllabuses. In course registration, candidates should pay special attention to the pre-requisite and co-requisite requirements of courses as specified in the syllabuses. A prerequisite is a course which candidates must have completed in accordance with the conditions stipulated by the Dean via the Head of Department before being permitted to take a course in question. A co-requisite is a course which candidates must take at the same time as the course in question.

### 3. Coursework and examination ratio

Each 6-credit course with the prefix STAT leads to one written examination paper which will be two hours in length, unless otherwise specified. The final grading will be determined by performance in the examination and assessment of coursework in the ratio of 75:25, unless otherwise stated. For courses with other prefixes, please check with the respective departments about the duration of examination and assessment ratio:

Candidates shall take 60 credits of courses in Year I comprising:

STAT1801.	Probability and statistics: Foundations of actuarial science	(6 credits)
STAT1802.	Financial mathematics	(6 credits)
BUSI1002.	Introduction to accounting	(6 credits)
CSIS1117.	Computer programming I	(6 credits)
MATH1813.	Mathematical methods for actuarial science	(6 credits)
ECON1001.	Introduction to Economics I	(6 credits)
ECON1002.	Introduction to Economics II	(6 credits)
	Any 6-credit introductory course	(6 credits)
CSCI0001.	Practical Chinese language course for science students	(3 credits)
ECEN1801.	Academic English for science students	(3 credits)
	6 credits of any broadening courses	(6 credits)

Candidates shall take 60 credits of courses in Year II comprising:

STAT2801.	Life contingencies	(6 credits)
STAT2802.	Statistical models	(6 credits)
STAT2803.	Stochastic models	(6 credits)
STAT2804.	Linear models and forecasting	(6 credits)
STAT2820.	Introduction to financial derivatives OR STAT2808. Derivatives markets	(6 credits)
STAT3801.	Advanced life contingencies	(6 credits)
STAT3810.	Risk theory	(6 credits)
	6 credits of courses selected from List B	(6 credits)
ECEN2802.	Advanced English for science students	(3 credits)
	Broadening courses:	
	Humanities and Social Sciences studies	(3 credits)
	Culture and Value Studies <i>or</i> any inter-faculty electives course outside BSc(ActuarSc) syllabus	(3 credits)
	At least 3 credits of any other broadening course	(3 credits)

Candidates shall take 60 credits of courses in Year III comprising:

STAT2805.	Credibility theory and loss distributions	(6 credits)
STAT2812.	Financial economics I	(6 credits)
STAT3811.	Survival analysis	(6 credits)
STAT3821.	Financial economics II	(6 credits)
STAT3322.	Market risk analysis	(6 credits)
	18 credits of courses selected from List C	(18 credits)
	6 credits of courses selected from List B	(6 credits)
	6 credits of inter/intra Faculty courses (advanced level)	(6 credits)

List B:

BUSI0019.	Intermediate accounting I
BUSI0020.	Intermediate accounting II
ECON2101.	Microeconomic theory
ECON2102.	Macroeconomic theory
ECON2113.	Microeconomic analysis
ECON2114.	Macroeconomic analysis
FINA0102.	Financial markets and institutions

FINA0304. Advanced corporate finance  
 MATH2303. Matrix theory and its applications  
 MATH2601. Numerical analysis  
 STAT2807. Corporate finance for actuarial science  
 Any other course approved by the Department of Statistics and Actuarial Science

List C: STAT2302. Statistical inference  
 STAT2306. Business logistics  
 STAT2312. Data mining  
 STAT3302. Multivariate data analysis  
 STAT3304. Computer-aided statistical modelling  
 STAT3306. Selected topics in statistics  
 STAT3316. Advanced probability  
 STAT3321. Credit risk analysis  
 STAT3802. Advanced contingencies  
 STAT3806. Investment and asset management  
 STAT3807. Fundamentals of actuarial practice  
 STAT3809. Current topics in actuarial science  
 STAT3819. Project in statistics and actuarial science  
 Any other course approved by the Department of Statistics and Actuarial Science

**STAT1801. Probability and statistics: foundations of actuarial science (6 credits)**

The purpose of this course is to develop knowledge of the fundamental tools in probability and statistics for quantitatively assessing risk. Applications of these tools to actuarial science problems will be emphasized. Students will have a thorough command of probability topics and the supporting calculations.

**STAT1802. Financial mathematics (6 credits)**

This course introduces the fundamental concepts of financial mathematics which plays an important role in the development of basic actuarial techniques. Practical applications of these concepts are also covered.

**STAT2302. Statistical inference (6 credits)**

This course covers the advanced theory of point estimation, interval estimation and hypothesis testing. Using a mathematically-oriented approach, the course provides a solid and rigorous treatment of inferential problems, statistical methodologies and the underlying concepts and theory. It is suitable in particular for students intending to further their studies or to develop a career in statistical research.

**STAT2306. Business logistics (6 credits)**

Originally, the word 'logistics' described the strategic aspects involved in moving and supplying armies and navies. Usage grew to include games of strategy, such as chess. Modern business corporations are increasingly using logistics as a management tool, for example, in capital budgeting problems, production planning, scheduling, transportation or in deciding a location for a new factory. This course addresses the business applications of logistics.



**STAT2312. Data mining (6 credits)**

With an explosion in information technology in the past decade, vast amounts of data appear in a variety of fields such as finance, marketing research, customer relations management, medicine and healthcare. The challenge of understanding these data with the aim of creating new knowledge and finding new relationships among data attributes has led to the innovative usage of statistical methodologies and development of new ones. In this process, a new area called data mining is spawned. This course provides a comprehensive and practical coverage of essential data mining concepts and statistical models for data mining.

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**STAT2801. Life contingencies (6 credits)**

The major objectives of this course are to integrate life contingencies into a full probabilistic framework and to demonstrate the wide variety of constructs which are then possible to build from basic models at the foundation of actuarial science. The time-until-death random variable will be the basic building block by which models for life insurances, designed to reduce the financial impact of the random event of untimely death, will be developed. Techniques for calculation benefit premiums and benefit reserves of various types of life annuity and insurance will be discussed.

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**STAT2802. Statistical models (6 credits)**

This course builds on STAT1801, introducing further the concepts and methods of statistics. Through the disciplines of statistical modelling, inference and decision making, students will be equipped with both quantitative skills and qualitative perceptions essential for making rigorous statistical analysis of data.

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**STAT2803. Stochastic models (6 credits)**

This is an introductory course in probability modelling. A range of important topics in stochastic processes will be discussed.

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**STAT2804. Linear models and forecasting (6 credits)**

This course deals with applied statistical methods of linear models and investigates various forecasting procedures through time series analysis.

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**STAT2805. Credibility theory and loss distributions (6 credits)**

Credibility is an example of a statistical estimate. The idea of credibility is v useful in premium calculation. Insurance loss varies according to the business nature, what distribution should be used to fit a particular loss is both of theoretical interest and practical importance. This course covers important actuarial and statistical methods.

**STAT2807. Corporate finance for actuarial science (6 credits)**

This course is designed for actuarial science students to receive VEE-Corporate Finance from Society of Actuaries. The objective of this course is to introduce students to the fundamental principles of corporate finance. The course will provide students with a systematic framework within which to evaluate investment and financing decisions for corporations.

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**STAT2812. Financial economics I (6 credits)**

This course is a basic course on the derivative market. The course covers discrete-time models, including volatility estimation, and Black-Scholes formula and its variations. The course also includes some basic risk management ideas and methods. This course and STAT3821 will cover all the concepts, principles and techniques needed for SoA Exam MFE.

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**STAT2813. Internship in actuarial science (6 credits)**

This course is offered to actuarial science students who take on an 6-month full time or similar internships. A student can complete this course as a project based on his/her internship. The report should emphasize important working/educational experiences encountered by the student during his/her internship. In many situations, this would mean a report of the project(s) that the student has been involved in his/her internship.

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**STAT2820. Introduction to financial derivatives (6 credits)**

This course aims at providing an understanding of the fundamental concepts of financial derivatives. Emphases are on basic trading and hedging strategies, and the concept of no-arbitrage. This course also serves as an introduction to the programming language Excel VBA, which will be used to perform various derivatives calculations.

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**STAT3302. Multivariate data analysis (6 credits)**

In many designed experiments or observational studies the researchers are dealing with multivariate data, where each observation is a set of measurements taken on the same individual. These measurements are often correlated. The correlation prevents the use of univariate statistics to draw inferences. This course develops the statistical methods for analysing multivariate data through examples in various fields of application and hands-on experience with the statistical software SAS.

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**STAT3304. Computer-aided statistical modelling (6 credits)**

This is a computer-aided course of statistical modelling designed for the students who have taken STAT2301 Linear Statistical Analysis and like to see theory illustrated by practical computation. Numerous real data sets will be presented for modelling and analysis using statistical software, such as SAS, for gaining hands-on experience. The course also aims to develop skills of model selection and hypotheses formulation for testing, so that questions of interest can be properly formulated and answered. An important element deals with model review and improvement, when one's first attempt does not adequately fit the data. Modern computer software such as SAS makes this interactive approach easier.

**STAT3306. Selected topics in statistics (6 credits)**

This course introduces basic statistical concepts and methods which potential graduate students will find useful in preparing for work on a research degree in statistics. Focus is on applications of state-of-the-art statistical techniques and their underlying theory.

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**STAT3316. Advanced probability (6 credits)**

This course provides an introduction to measure theory and probability. The course will focus on some basic concepts in probability which are essential for students to read research papers in actuarial science, probability and statistics.

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**STAT3321. Credit risk analysis (6 credits)**

For a commercial bank, credit risk has always been the most significant. It is the risk of default on debt, swap, or other counterparty instruments. Credit risk may also result from a change in the value of an asset resulting from a change in the counterparty's creditworthiness. This course will introduce students to quantitative models for measuring and managing credit risk. It also aims to provide students with an understanding of the credit risk methodology used in the financial industry and the regulatory framework in which the credit risk models operate.

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**STAT3322. Market risk analysis (6 credits)**

Financial risk management has experienced a revolution in the last decade thanks to the introduction of new methods for measuring risk, particularly Value-at-Risk (VaR). This course introduces modern risk management techniques covering the measurement of market risk using VaR models and financial time series models, and stress testing.

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**STAT3801. Advanced life contingencies (6 credits)**

This course builds on the material covered in STAT2801. Several extensions of the basic theory of life contingencies and insurance models are discussed. The analysis of financial benefits contingent on the time of death of a single life can be extended to benefits involving several lives. The multiple decrement models, instead of a single contingency of death, are studied. Applications of these advanced theories are given.

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**STAT3802. Advanced contingencies (6 credits)**

This course serves as a continuation of STAT3801 and extends the coverage to include statistical models and actuarial techniques used in the field of life and non-life insurance. [Students are reminded that this course is a part of the requirement for the exemption from the Subject CT5 Contingencies of the Faculty and Institute of Actuaries, U.K.]

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**STAT3806. Investment and asset management (6 credits)**

This course provides basic analysis of various investment instruments and asset management techniques. Emphasis will be placed on methods to tackle problems faced by insurance industry such as investment strategy formulation and interest rate risk management.

**STAT3807. Fundamentals of actuarial practice (6 credits)**

This course covers basic principles of design, risk classification, pricing/ratemaking/funding, profit/surplus analysis, and valuation of financial security programmes including life, health, retirement plans, and property/casualty insurance.

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**STAT3809. Current topics in actuarial science (6 credits)**

This course covers a range of topics related to professional actuarial work which may include topics from fundamental and practical concepts in the laws of contract, tort and insurance, regulatory requirements law, actuarial practice in both life and casualty insurance.

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**STAT3810. Risk theory (6 credits)**

Risk theory is one of the main topics in actuarial science. Risk theory is the applications of statistical models and stochastic processes to insurance problems such as the premium calculation, policy modifications, ruin probability, etc.

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**STAT3811. Survival analysis (6 credits)**

This course is concerned with how models which predict the survival pattern of humans or other entities are established. This exercise is sometimes referred to as survival-model construction.

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**STAT3819. Project in statistics and actuarial science (6 credits)**

Each year a few projects suitable for Actuarial Science students will be offered. These projects, under the supervision of individual staff members involve the application of statistics and/or probability in interesting situations. They provide students with practical experience in approaching a real problem, in report writing and in oral presentation.

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**STAT3821. Financial economics II (6 credits)**

This course is an advanced course on the option pricing theory. The course covers Black-Scholes equation and stochastic calculus, and interest models. This course and STAT2812/STAT2806 will cover all the concepts, principles and techniques needed for SoA Exam MFE.