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

These regulations apply to students admitted to the BSc in Actuarial Science degree curriculum in the academic year 2010-2011 and thereafter.

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

Definitions

AS1[1] For the purpose of these regulations and the syllabuses for the degree of BSc in Actuarial Science, unless the context otherwise requires:

"Course" means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

"Syllabus" means courses taught by departments, centres, and schools, offered under a degree curriculum.

"Credits" or "credit-units" means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

Admission to the BSc in Actuarial Science degree

AS2 To be eligible for admission to the BSc in Actuarial Science degree, candidates shall:
(a) comply with the General Regulations;
(b) comply with the Regulations for First Degree Curricula; and
(c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.

Period of study

AS3 The curriculum for the BSc(ActuarSc) degree shall normally require six semesters of full-time study, extending over not fewer than three academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of five academic years.

Selection of courses

AS4 Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each semester. Any change to the selection of courses shall be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate. Requests for changes after the designated add/drop period of the semester shall not be considered.

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[1] This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

Curriculum requirements and progression in curriculum

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(a) Candidates shall satisfy the requirements prescribed in UG5 of the Regulations of First Degree Curricula.

(b) Candidates shall take not fewer than 180 credits, in the manner specified in these regulations and the syllabuses, including the 144 credits of required courses as prescribed in the BSc(ActuarSc) degree curriculum.

(c) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements may be fewer than 24 credits.

(d) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load of 216 credits for the normative period of study specified in the curriculum regulations, save as provided for under AS5(e).

(e) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load of 360 credits for the maximum period of registration specified in the curriculum regulations.

(f) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits will be recorded on the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.

(g) Candidates shall be required to discontinue their studies if they have:

  (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or

  (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters, or

  (iii) exceeded the maximum period of registration specified in AS3, unless otherwise permitted by the Board of the Faculty.

Advanced standing

AS6 Advanced standing may be granted to candidates in recognition of studies completed successfully in an approved institution of higher education elsewhere in accordance with UG2 of the Regulations for First Degree Curricula. Credits granted for advanced standing will be recorded on the transcript of the candidate but shall not be included in the calculation of the GPA.

Assessment

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(a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only satisfactorily completed courses will earn credits.

(b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course 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 the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.

(c) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.

(d) Candidates are required to make up for failed courses in the following manner: repeating the failed course by undergoing instruction and satisfying the assessment, or for elective courses, taking another course in lieu and satisfying the assessment requirements.

Degree classification

AS8 To be eligible for the award of the BSc in Actuarial Science degree, candidates shall have:

(a) satisfied the requirements in UG5 of the Regulations for First Degree Curricula;

(b) passed not fewer than 180 credits, comprising all required courses as prescribed in the BSc(ActuarSc) degree curriculum.

AS9 The degree of Bachelor of Science in Actuarial Science shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. A list of candidates who have successfully completed all the degree requirements shall be posted on Faculty notice boards.

SYLLABUSES FOR THE DEGREE OF BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE

(Offered to students admitted to Year 1 in 2010-2011.)

Objectives:

The Actuarial Science curriculum at the University of Hong Kong aims at providing formal academic and professional training to students who wish to join the actuarial profession. Although actuarial science is a separate discipline with its own area of knowledge, modern actuarial training requires multidisciplinary knowledge such as probability, statistics, economics, investment, finance, law, taxation, and accounting. The Actuarial Science curriculum reflects this by incorporating various interdisciplinary courses into the basic actuarial training. The programme is set up to equip students with solid background in actuarial science, to develop their confidence and analytical skills to define and tackle problems in actuarial science and other related fields. Specifically, the programme is designed to provide adequate knowledge for students to sit for the early professional examinations organized by international actuarial organizations so that they can successfully join the actuarial profession after graduation. In addition, the programme provides enough academic training for students who wish to pursue postgraduate studies in actuarial science or other related areas.

Learning Outcomes:

Students would be able to:

a. Understand and apply various analytic and quantitative methods to define and solve problems in insurance, finance, economics, investment, pension, financial risk management and demography. (by means of coursework and tutorial classes and/or research-based project in the curriculum)

b. Understand and identify the nature of insurance, finance and investment risks.
   (by means of coursework and tutorial classes and/or research-based project in the curriculum)
c. Develop analytical skills to evaluate and measure various kinds of risk.
   (by means of coursework and tutorial classes and/or research-based project in the curriculum)
d. Formulate effective business strategies to manage them.
   (by means of coursework and tutorial classes and/or research-based project in the curriculum)
e. Pass the early professional examinations organized by international actuarial organizations.
   (by means of coursework and tutorial classes and/or research-based project in the curriculum)
f. Pursue postgraduate studies in actuarial science or other related fields.
   (by means of coursework and tutorial classes and/or research-based project in the curriculum)
g. Discuss current actuarial issues and acquire and apply practical knowledge in some specially designed courses.
   (by means of coursework and tutorial classes and/or research-based project in the curriculum)
   In addition, some students can join our internship programme to gain work experience before graduation.
   (by means of internship in the curriculum)

Minimum Entry Requirement: NA
Minimum Credit Requirement: NA
Impermissible Combination: NA

Required courses (180 credits)

1. Year I Courses (60 credits)

Core (Introductory level) courses (48 credits):
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)
FINA1003 Corporate finance (6 credits)

Language and Common Core Courses (12 credits):
CSCI0001 Practical Chinese language course for science students (3 credits)
CAES1801 Academic English for science students (3 credits)
Common Core Course (6 credits)

2. Year II Courses (60 credits) (note 1)

Core (Advanced level) courses (48 credits):
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 (6 credits)
STAT3801 Advanced life contingencies (6 credits)
STAT3810 Risk theory (6 credits)
Any advanced level course selected from Inter/Intra Faculty Courses (6 credits)

Language, Common Core and Elective Courses (12 credits):
CAES2802 Advanced English for science students (3 credits)
Common Core Course (6 credits)
Any level course selected from Inter/Intra Faculty Courses (3 credits)

3. Year III Courses (60 credits) (note 1)

Core (advanced level) courses (48 credits):
STAT2805 Credibility theory and loss distributions (6 credits)
STAT2812 Financial economics I (6 credits)
STAT3322 Market risk analysis (6 credits)
STAT3811 Survival analysis (6 credits)
STAT3821 Financial economics II (6 credits)

Plus

18 credits from the following courses:
STAT2302 Statistical inference (6 credits)
STAT2306 Business logistics (6 credits)
STAT2312 Data mining (6 credits)
STAT3302 Multivariate data analysis (6 credits)
STAT3304 Computer-aided statistical modelling (6 credits)
STAT3306 Selected topics in statistics (6 credits)
STAT3316 Advanced probability (6 credits)
STAT3321 Credit risk analysis (6 credits)
STAT3802 Advanced contingencies (6 credits)
STAT3806 Investment and asset management (6 credits)
STAT3807 Fundamentals of actuarial practice (6 credits)
STAT3809 Current topics in actuarial science (6 credits)
STAT3819 Project in statistics and actuarial science (6 credits)

Elective courses (12 credits):
Any advanced level course selected from Inter/Intra Faculty Courses (12 credits)

Notes:
1 Special arrangements for students who take on 6-month (or longer) Full-time Internships:
   (a) Students should be in full-time status for at least six academic semesters in additional to their internships in order to fulfill the degree requirements.
   (b) 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.
   (c) Special attention should be paid if students intend to take on full-time internships in the 2nd semester of Year 2 (2nd semester of Year 3 respectively). They have to take the courses specified in the table during the 1st semester of Year 2 (1st 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.

Details of the table will be provided in 2011-2012.

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)

Modern business corporations are increasingly using logistics as a management tool, for example, in capital budgeting problems, production planning, scheduling, transportations and 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, customer relations management, medicine. 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.

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.

STAT2802. Statistical models (6 credits)

This course is on the basis of 'STAT1801 Probability and Statistics: Foundation of Actuarial Science'. It will further study the concepts and methods of statistics. The course will lay emphasis on the estimation and hypothesis testing, the two major areas of statistical inference. Through the study of this course, students will be equipped with both quantitative skills and qualitative perceptions essential for making rigorous statistical analysis of data.

STAT2803. Stochastic models (6 credits)

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

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.

STAT2805. Credibility theory and loss distributions (6 credits)

Credibility is an example of a statistical estimate. The idea of credibility is very 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.

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.

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. The objective is for a student to complete this course as a project based on his/her internship.

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.

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 analyzing multivariate data through examples in various fields of application and hands-on experience with the statistical software SAS.

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. Real data sets will be presented for modelling and analysis using statistical software SAS for gaining hands-on experience. The course aims to develop skills of model selection and hypotheses formulation 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.

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.

STAT3316. Advanced probability (6 credits)

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

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.

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.

STAT3801. Advanced life contingencies (6 credits)

The objective of this course is to prepare students for the Markov Chain Models and Life insurances and annuities parts of the MLC course of the Society of Actuaries. Emphasis will be placed on applications of more advanced theories of life contingencies.

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, UK]

STAT3806. Investment and asset management (6 credits)

The main objective of this course is to introduce students to some of the methods and procedures commonly used in the management of an investment portfolio. 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 teaches students about the business environment and exposes them to practical real-world situations using the actuarial control cycle as a framework.

STAT3809. Current topics in actuarial science (6 credits)

This course aims at providing practical elements for actuarial students including daily life actuarial practice and also law element, which will benefit students in their coming future career.

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, ruin probability, etc.

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.

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

Each year a few projects suitable for Actuarial Science students will be offered to provide students with practical experience in approaching a real problem, in report writing and in oral presentation.

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.