

BSc in Actuarial Science

Syllabuses and Regulations
(4-year curriculum)

2017-18

Faculty of Science
The University of Hong Kong

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SECTION I Objectives and Learning Outcomes

Degree : Bachelor of Science in Actuarial Science

Objectives : The Actuarial Science curriculum 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 of Actuarial Science Programme

By the end of this programme, students should be able to:

- (1) 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)
- (2) 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)
- (3) develop analytical skills to evaluate and measure various kinds of risk, and appraise the related moral and ethical issues
(by means of coursework and tutorial classes and/or research-based project in the curriculum)
- (4) formulate effective business strategies to manage various kinds of risk
(by means of coursework and tutorial classes and/or research-based project in the curriculum)
- (5) communicate and collaborate with people effectively on issues related to actuarial science
(by means of coursework and tutorial classes and/or research-based project in the curriculum)
- (6) 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)

SECTION II Credit Unit Statement of the BSc(ActuarSc) Degree Curriculum (4-year)

1. General guideline for contact hours requirement in the BSc (Actuarial Science) Degree Curriculum

- (a) A 6-credit course has around 120-180 total study hours, including contact hours, study time, assignment and assessment.
- (b) About 30% of the total study hours are actual contact hours in the form of a class, e.g. lecture hours.
- (c) A 6-credit course has around 36 to 45 lecture hours.
- (d) For lecture-based courses, normally there will be tutorial/discussion sessions.
- (e) For courses employing a non-lecture or lab-based approach, e.g. IT-based or project-based courses, students are expected to devote about 120-180 hours for a 6-credit course.

2. Credit Unit Statement of the BSc (Actuarial Science) Degree Curriculum

The BSc(Actuarial Science) degree curriculum consists of five major types of courses based on the learning activities. The courses in the curriculum are 6 credits. Examples of the contact hours requirements for the five categories of courses are described as follows.

(a) Lecture-based courses (6 credits)

Contact hours: 36 hours of lectures and 12 hours of tutorial/discussion

These courses are taught predominantly by lectures and tutorials. Assessment is by a combination of examination (0-80%) and continuous assessment (20-100%). Continuous assessment tasks include written assignments (totaling no more than 8,000 words) such as essays and project reports, and oral presentations. Details of the assessment tasks can be found in the description of individual courses.

(b) Lecture with laboratory component courses (6 credits)

Contact hours for 6-credit course: 24 hours of lectures, 24 hours of laboratory and 6 hours of tutorial

These courses are taught by a combination of lectures and laboratory/practical sessions. Assessment is by a combination of examination (0-70%) and continuous assessment (30-100%). Continuous assessment tasks include written assignments (totaling no more than 8,000 words) such as essays, laboratory reports, and project reports, and oral presentations. Details of the assessment tasks can be found in the description of individual courses.

(c) Laboratory and Workshop courses (6 credits)

Contact hours: 48 hours of laboratory or workshop and 12 hours of tutorial

These courses aim at enriching the student's research skills and encourage group work through hands-on activities in which science research is introduced. Students are expected to spend an additional 100 hours on self-study, preparation work for the laboratory, and writing reports. Continuous assessment tasks (100%) include written assignments (totaling no more than 8,000 words) such as laboratory report for each experiment (normally no more than 10 experiments) and essays. Details of the assessment tasks can be found in the description of individual courses.

(d) Project-based courses (6 credits)

These courses aim at providing students with an opportunity to pursue their own research interest under the supervision of a teacher. The teacher normally meets with the student weekly to discuss project progress. Assessment task is normally through research reports or a dissertation (totaling no more than 10,000 words for a 6-credit course and 20,000 words for a 12-credit course). Oral presentation will form part of the assessment. Details of the assessment tasks can be found in the description of individual courses.

(e) Internship (6 credits)

Students have to undertake at least 160 hours of internship work

Internships aim to offer students the opportunity to gain work experience related to their major of study. The teacher meets with the student regularly to discuss work progress. Students have to undertake at least 160 hours of internship work arranged formally. Assessment tasks normally include the following outputs: a written report of no more than 2000 words and feedback from the internship supervisor and an oral presentation on students' internship experience. Details of the assessment tasks can be found in the description of individual courses.

SECTION III List of BSc(ActuarSc) Courses* on offer in 2017/18 and 2018/19[^]

Course Code	Title	Credit	Pre-requisite	Available in		Semester offered in 2017 - 2018	Exam. held in 2017 - 2018	Quota	Course Coordinator	Major / Minor (The Major/Minor that this course appears as.)			
				2017 - 2018	2018 - 2019					0=year long 1=1st sem 2=2nd sem S=Summer	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course
Department of Statistics & Actuarial Science													
STAT2901	Probability and statistics: foundations of actuarial science	6	Pass in MATH1821 [for BSc(ActuarSc) students] or already enrolled in this course, or Pass in MATH1013 or already enrolled in this course [for students outside the BSc(ActuarSc) programme]; and Not for students who have passed or enrolled in any of these courses: STAT1601, STAT1602, STAT1603, STAT2601	Y	Y	2	May	---	Dr C W Kwan, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)	Minor in Actuarial Studies (2017,2016,2015,2014, 2013,2012)		
STAT2902	Financial mathematics	6	Pass in STAT2901, or already enrolled in this course; and Not for students who have passed in STAT3615, or already enrolled in this course.	Y	Y	2	May	---	Prof K C Yuen, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)			
STAT3602	Statistical inference	6	Pass in STAT2602 or STAT3902	Y	Y	1	Dec	---	Prof S M S Lee, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012); Major in Statistics (2017,2016,2015,2014, 2013,2012); Minor in Statistics (2017,2016,2015,2014, 2013,2012)		
STAT3612	Data mining	6	Pass in STAT2602 or (STAT1603 and any University level 2 course) or STAT3902; and Pass in STAT3600 or STAT3907, or already enrolled in these courses.	Y	Y	2	No exam	50	Dr A J Zhang, Statistics & Actuarial Science	Major in Decision Analytics (2017,2016,2015,2014, 2013,2012)	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012); Major in Risk Management (2017,2016,2015,2014, 2013,2012); Major in Statistics (2017,2016,2015,2014, 2013,2012); Minor in Risk Management (2017,2016,2015,2014, 2013,2012); Minor in Statistics (2017,2016,2015,2014, 2013,2012)		
STAT3616	Advanced SAS programming	6	Pass in STAT2601 or STAT2901 (Students are strongly recommended to take STAT2603 prior to taking this course.)	N	Y	---	---	50	TBC, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012); Major in Decision Analytics (2017,2016,2015,2014, 2013,2012); Major in Statistics (2017,2016,2015,2014, 2013,2012); Minor in Statistics (2017,2016,2015,2014, 2013,2012)		
STAT3901	Life contingencies	6	(Pass in STAT2602 and STAT3615) or (Pass in STAT2902 and (Pass in STAT3902 or already enrolled in this course)) or (Pass in STAT2602 and STAT2902)	Y	Y	1	Dec	---	Prof K C Yuen, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)	Minor in Actuarial Studies (2017,2016,2015,2014, 2013,2012)		

* This list only includes courses offered by the Department of Statistics & Actuarial Science and the Department of Mathematics and language courses.

[^] Availability of courses in 2018-2019 is subject to change.

STAT3902	Statistical models	6	Pass in STAT2901; and Not for students who have passed in STAT2602, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec	---	Dr G C S Lui, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT3903	Stochastic models	6	Pass in STAT2901; and Not for students who have passed in MATH3603, or have already enrolled in this course; and Not for students who have passed in STAT3603, or have already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	May	---	Prof J J F Yao, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT3904	Corporate finance for actuarial science	6	[(Pass in ACCT1101 and STAT2902) or (Pass in STAT3610 and STAT3615)]; and Not for students who have passed in FINA1310, or have already enrolled in this course.	Y	Y	2	May	---	Dr D Lee, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)	Minor in Actuarial Studies (2017,2016,2015,2014, 2013,2012)	
STAT3905	Introduction to financial derivatives	6	Pass in STAT2902; and Not for students who have passed in STAT3618, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec	---	Dr K C Cheung, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT3906	Risk theory I	6	Pass in STAT3903, or already enrolled in this course; or Pass in MATH3603 or STAT3603	Y	Y	2	May	---	Dr K C Cheung, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)	Minor in Actuarial Studies (2017,2016,2015,2014, 2013,2012)	
STAT3907	Linear models and forecasting	6	Pass in STAT2602 or STAT3902, or already enrolled in this course; and Not for students who have passed in STAT3600, or have already enrolled in this course; and Not for students who have passed in STAT4601, or have already enrolled in this course; and Not for students who have passed in ECON2280, or have already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	May	---	Dr G Li, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT3908	Credibility theory and loss distributions	6	Pass in STAT2602 or STAT3902 or STAT3906	Y	Y	1	Dec	---	Dr A G Benchimol, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)	Minor in Actuarial Studies (2017,2016,2015,2014, 2013,2012)	
STAT3909	Advanced life contingencies	6	Pass in STAT3901, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	May	---	Dr D Lee, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT3910	Financial economics I	6	Pass in STAT2602 or STAT3902; and Not for students who have passed in STAT3618, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course.	Y	Y	1	Dec	---	Prof H L Yang, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)	Minor in Actuarial Studies (2017,2016,2015,2014, 2013,2012)	
STAT3911	Financial economics II	6	Pass in MATH3603 or STAT3603 or STAT3903 or STAT3910	Y	Y	2	May	---	Prof H L Yang, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)	Major in Risk Management (2017,2016,2015,2014, 2013,2012); Minor in	

											Actuarial Studies (2017,2016,2015,2014, 2013,2012)		
STAT3951	Advanced contingencies	6	Pass in STAT3909; and Pass in STAT3910, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec	---	Dr D Lee, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT3952	Investment and asset management	6	Pass in STAT3901; and Not for students who have passed in FINA2320, or have already enrolled in this course; and For BSc(Actuarial Science) students only.	N	N	---	---	---	TBC, Statistics & Actuarial Science		BSc in Actuarial Science (2012)		
STAT3953	Fundamentals of actuarial practice	6	Pass in STAT3909; and For BSc(Actuarial Science) students only.	Y	Y	1	No exam	---	Mr P P Y Lau, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT3954	Current topics in actuarial science	6	Pass in STAT3901, or already enrolled in this course; or Pass in STAT3909, or already enrolled in this course; and For BSc(Actuarial Science) students only.	N	N	---	---	---	TBC, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT3955	Survival analysis	6	Pass in STAT3902, or already enrolled in this course; or Pass in STAT3600 or STAT3901	Y	Y	2	May	---	Dr J F Xu, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012); Major in Statistics (2017,2016,2015,2014, 2013,2012); Minor in Statistics (2017,2016,2015,2014, 2013,2012)		
STAT3956	Pension funds and pension mathematics	6	Pass in STAT3909; and For BSc(Actuarial Science) students only.	N	Y	---	---	---	Prof G Ma, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012)		
STAT4602	Multivariate data analysis	6	Pass in STAT3600 or STAT3907	Y	Y	2	May	50	Prof T W K Fung, Statistics & Actuarial Science	Major in Statistics (2017,2016,2015,2014, 2013,2012)	BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012); Major in Decision Analytics (2017,2016,2015,2014, 2013,2012); Minor in Statistics (2017,2016,2015,2014, 2013,2012)		
STAT4607	Credit risk analysis	6	Pass in STAT3618 or STAT3905 or STAT3910 or (FINA2322 and any University level 3 course)	Y	Y	1	Dec	---	Dr K P Wat, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012); Major in Risk Management (2017,2016,2015,2014, 2013,2012); Minor in Risk Management (2017,2016,2015,2014, 2013,2012)		
STAT4608	Market risk analysis	6	Pass in STAT3907 and STAT3910; or Pass in STAT4601 and (FINA2320 or STAT3609)	Y	Y	2	May	---	Dr Z Zhang, Statistics & Actuarial Science		BSc in Actuarial Science (2017,2016,2015,2014, 2013,2012); Major in Risk Management (2017,2016,2015,2014, 2013,2012); Minor in Risk Management		

List of BSc(ActuarSc) Courses

											(2017,2016,2015,2014,2013,2012)	
STAT4711	Capstone experience for actuarial science undergraduates	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses in BSc(Actuarial Science) programme including (Pass in STAT3901, or already enrolled in this course; or Pass in STAT3909, or already enrolled in this course); and This capstone course is only for BSc (Actuarial Science) students, and is mutually exclusive with STAT4767 and STAT4798. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam	50	Prof G Yin, Statistics & Actuarial Science			BSc in Actuarial Science (2017,2016,2015,2014,2013,2012)
STAT4767	Actuarial science internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses in BSc(Actuarial Science) programme including STAT3901; and This capstone course is only for BSc (Actuarial Science) students; and is mutually exclusive with STAT4711. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam	---	Dr A G Benchimol, Statistics & Actuarial Science			BSc in Actuarial Science (2017,2016,2015,2014,2013,2012)
STAT4798	Statistics and actuarial science project	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses in BSc(Actuarial Science) programme including STAT3902 and STAT3907; and Pass or already enrolled in at least one of the following courses: STAT3616, STAT3911, STAT4602; and This capstone course is only for BSc (Actuarial Science) students; and subject to the consent of course coordinator. This course is mutually exclusive with STAT4711. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam	50	Prof S M S Lee, Statistics & Actuarial Science			BSc in Actuarial Science (2017,2016,2015,2014,2013,2012)
STAT4901	Risk theory II	6	Pass in STAT3906	N	Y	---	---	---	TBC, Statistics & Actuarial Science			BSc in Actuarial Science (2017,2016,2015,2014,2013,2012)
STAT4902	Selected topics in actuarial science	6	Pass in STAT3906	N	N	---	---	---	TBC, Statistics & Actuarial Science			BSc in Actuarial Science (2017,2016,2015,2014,2013,2012)
STAT4903	Actuarial techniques for general insurance	6	Pass in STAT3906	Y	Y	2	May	---	Dr A G Benchimol, Statistics & Actuarial Science			BSc in Actuarial Science (2017,2016,2015,2014,2013,2012); Minor in Actuarial Studies (2017,2016,2015,2014,2013,2012)
STAT7609	Research methods in statistics	6	Pass in STAT3600 or STAT3907	Y	Y	1	Dec	---	Dr J F Xu, Statistics & Actuarial Science			
STAT7610	Advanced probability	6	Pass in STAT3603 or STAT3903	Y	Y	1	Dec	---	Dr J Song, Mathematics			
STAT7611	Computational statistics	6	Pass in STAT3600 or STAT3907	Y	Y	1	Dec	---	Prof G Yin, Statistics & Actuarial Science			
STAT7615	Advanced quantitative risk management and finance	6	Pass in STAT4608	Y	Y	2	May	---	Prof W K Li, Statistics & Actuarial Science			

SECTION IV Equivalency of HKDSE and other qualifications**Table of Equivalence between HKDSE and Other Qualifications**

HKDSE	Grade	Equivalent Qualification to HKDSE				
		IB	GCE	SATII	AP	Gao Kao (高考)
Biology	3 or above	Biology (SL/HL)	Biology (AL)	Biology	Biology	Equivalent to fulfillment of all HKDSE requirements
Chemistry	3 or above	Chemistry (SL/HL)	Chemistry (AL)	Chemistry	Chemistry	
Physics	3 or above	Physics (SL/HL)	Physics (AL)	Physics	Physics B or C	
Mathematics	2 or above	Mathematics (SL)/Mathematical Studies (SL)	Mathematics (AL)	Mathematics Level 1 or 2		
Mathematics + (M1 or M2)	2 or above	Mathematics (HL)/Mathematical Studies (HL)	Pure Mathematics (AL) Further Mathematics (AL)		Calculus AB or BC	

Note:

HL: Higher Level

SL: Standard Level

AL: Advanced Level

Remarks:

For science students admitted through non-JUPAS scheme, the equivalent subject qualification(s) to HKDSE, if possessed, can be identified by the SIS for on-line course selection.

For other non-science students admitted through non-JUPAS scheme, they are still required to obtain the written approval from the Course Selection Adviser of the course offering department even they have possessed the equivalent HKDSE subject qualification(s) to meet the course prerequisite requirement. Once approval is given, they need to forward it to their home faculties to add the course on-line.