BSc in Actuarial Science

Syllabuses and Regulations
(4-year curriculum)

2017-18

Faculty of Science
The University of Hong Kong
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)
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.
### List of BSc(ActuarSc) Courses

#### Department of Statistics & Actuarial Science

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit</th>
<th>Pre-requisite</th>
<th>Available in 2017 - 2018</th>
<th>Available in 2018 - 2019</th>
<th>Exam. held in 2017 - 2018</th>
<th>Course Coordinator</th>
<th>Major / Minor (The Major/Minor that this course appears as)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT2901</td>
<td>Probability and statistics: foundations of actuarial science</td>
<td>6</td>
<td>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</td>
<td>Y Y 2 May</td>
<td>---</td>
<td>---</td>
<td>Dr C W Kwan, Statistics &amp; Actuarial Science</td>
<td>BSc in Actuarial Science (2017,2016,2015,2014,2013,2012) Minor in Actuarial Studies (2017,2016,2015,2014,2013,2012)</td>
</tr>
<tr>
<td>STAT2902</td>
<td>Financial mathematics</td>
<td>6</td>
<td>Pass in STAT2901, or already enrolled in this course; and Not for students who have passed in STAT3615, or already enrolled in this course.</td>
<td>Y Y 2 May</td>
<td>---</td>
<td>---</td>
<td>Prof K C Yuen, Statistics &amp; Actuarial Science</td>
<td>BSc in Actuarial Science (2017,2016,2015,2014,2013,2012)</td>
</tr>
<tr>
<td>STAT3616</td>
<td>Advanced SAS programming</td>
<td>6</td>
<td>Pass in STAT2601 or STAT2901 (Students are strongly recommended to take STAT2603 prior to taking this course.)</td>
<td>N Y ---</td>
<td>---</td>
<td>50</td>
<td>TBC, Statistics &amp; Actuarial Science</td>
<td>BSc in Actuarial Science (2017,2016,2015,2014,2013,2012)</td>
</tr>
</tbody>
</table>

* 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.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester</th>
<th>Year</th>
<th>Instructor</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
<td>Prerequisites</td>
<td>Exam Type</td>
<td>Exam Period</td>
</tr>
<tr>
<td>-------------</td>
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<td>-------------------------------------------------------------------------------</td>
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<td>-------------</td>
</tr>
<tr>
<td>STAT3951</td>
<td>Advanced contingencies</td>
<td>6</td>
<td>Pass in STAT3909; and Pass in STAT3910, or already enrolled in this course; and For BSc(Actuarial Science) students only.</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>STAT3952</td>
<td>Investment and asset management</td>
<td>6</td>
<td>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.</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>STAT3954</td>
<td>Current topics in actuarial science</td>
<td>6</td>
<td>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.</td>
<td>N</td>
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</tr>
</tbody>
</table>
### List of BSc(ActuarSc) Courses

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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Mode</th>
<th>Exam</th>
<th>Instructor(s)</th>
<th>Program</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT4711</td>
<td>Capstone experience for actuarial science undergraduates</td>
<td>6</td>
<td>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.</td>
<td>Y</td>
<td>Y</td>
<td>1, 2</td>
<td>No exam</td>
<td>50</td>
</tr>
<tr>
<td>STAT4767</td>
<td>Actuarial science internship</td>
<td>6</td>
<td>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.</td>
<td>Y</td>
<td>Y</td>
<td>1, 2</td>
<td>No exam</td>
<td>---</td>
</tr>
<tr>
<td>STAT4798</td>
<td>Statistics and actuarial science project</td>
<td>6</td>
<td>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, STAT4652; 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.</td>
<td>Y</td>
<td>Y</td>
<td>1, 2</td>
<td>No exam</td>
<td>50</td>
</tr>
</tbody>
</table>
## Equivalency of HKDSE and Other Qualifications

### Table of Equivalence between HKDSE and Other Qualifications

<table>
<thead>
<tr>
<th>HKDSE</th>
<th>Grade</th>
<th>Equivalent Qualification to HKDSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>3 or above</td>
<td>IB: Biology (SL/HL)</td>
</tr>
<tr>
<td>Chemistry</td>
<td>3 or above</td>
<td>IB: Chemistry (SL/HL)</td>
</tr>
<tr>
<td>Physics</td>
<td>3 or above</td>
<td>IB: Physics (SL/HL)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2 or above</td>
<td>IB: Mathematics (SL)/Mathematical Studies (SL)</td>
</tr>
<tr>
<td>Mathematics + (M1 or M2)</td>
<td>2 or above</td>
<td>IB: Mathematics (HL)/Mathematical Studies (HL)</td>
</tr>
</tbody>
</table>

**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.
Programme Title: BSc in Actuarial Science

Offered to students admitted to Year 1 in 2017

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.

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PLO 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)

Impermissible Combinations:
Minor in Actuarial Studies

Required courses (138 credits)
1. Year I Courses
Core courses (42 credits):
Disciplinary Core Courses (42 credits)

ACCT1101 Introduction to financial accounting (6)
ECON1210 Introductory microeconomics (6)
ECON1220 Introductory macroeconomics (6)
MATH1821 Mathematical methods for actuarial science I (6)
MATH2822 Mathematical methods for actuarial science II (6)
STAT2901 Probability and statistics: foundations of actuarial science (6)
STAT2902 Financial mathematics (6)

2. Year II Courses
Disciplinary Core Courses (42 credits)

COMP1117 Computer programming (6)
STAT3901 Life contingencies (6)
STAT3902 Statistical models (6)
STAT3903 Stochastic models (6)
STAT3904 Corporate finance for actuarial science (6)
STAT3905 Introduction to financial derivatives (6)
STAT3906 Risk theory I (6)

3. Year III Courses
Disciplinary Core Courses (30 credits)

STAT3907 Linear models and forecasting (6)
STAT3908 Credibility theory and loss distributions (6)
STAT3909 Advanced life contingencies (6)
STAT3910 Financial economics I (6)
STAT3911 Financial economics II (6)

4. Year IV Courses
Disciplinary Electives (18 credits)
At least 18 credits from List A and List B, with at least 12 credits from List A:

List A

STAT3951 Advanced contingencies (6)
STAT3954 Current topics in actuarial science (6)
STAT3955 Survival analysis (6)
STAT3956 Pension funds and pension mathematics (6)
STAT4607 Credit risk analysis (6)
STAT4608 Market risk analysis (6)
STAT4901 Risk theory II (6)
STAT4903 Actuarial techniques for general insurance (6)
List B

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT3602</td>
<td>Statistical inference (6)</td>
</tr>
<tr>
<td>STAT3612</td>
<td>Data mining (6)</td>
</tr>
<tr>
<td>STAT3616</td>
<td>Advanced SAS programming (6)</td>
</tr>
<tr>
<td>STAT3953</td>
<td>Fundamentals of actuarial practice (6)</td>
</tr>
<tr>
<td>STAT4602</td>
<td>Multivariate data analysis (6)</td>
</tr>
<tr>
<td>STAT4902</td>
<td>Selected topics in actuarial science (6)</td>
</tr>
</tbody>
</table>

5. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

- STAT4711 Capstone experience for actuarial science undergraduates (6)
- STAT4767 Actuarial science internship (6)
- STAT4798 Statistics and actuarial science project (6)

Notes:

1. Students are expected to be in full-time status for eight academic semesters (in additional to their 6-month or longer full-time internships) in order to fulfill the degree requirements.

2. Students may optionally take Majors or Minors outside the BSc(ActuarSc) programme, provided that they fully satisfy the requirements.

Remarks:

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the programme in order to satisfy the degree graduation requirements.
Programme Title: BSc in Actuarial Science
Offered to students admitted to Year 1 in 2016

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.

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PLO 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)

Impermissible Combinations:
Minor in Actuarial Studies

Required courses (138 credits)

1. Year I Courses
Core courses (42 credits):
Disciplinary Core Courses (42 credits)

ACCT1101 Introduction to financial accounting (6)
ECON1210 Introductory microeconomics (6)
ECON1220 Introductory macroeconomics (6)
MATH1821 Mathematical methods for actuarial science I (6)
MATH2822 Mathematical methods for actuarial science II (6)
STAT2901 Probability and statistics: foundations of actuarial science (6)
STAT2902 Financial mathematics (6)

2. Year II Courses
Disciplinary Core Courses (42 credits)

COMP1117 Computer programming (6)
STAT3901 Life contingencies (6)
STAT3902 Statistical models (6)
STAT3903 Stochastic models (6)
STAT3904 Corporate finance for actuarial science (6)
STAT3905 Introduction to financial derivatives (6)
STAT3906 Risk theory I (6)

3. Year III Courses
Disciplinary Core Courses (30 credits)

STAT3907 Linear models and forecasting (6)
STAT3908 Credibility theory and loss distributions (6)
STAT3909 Advanced life contingencies (6)
STAT3910 Financial economics I (6)
STAT3911 Financial economics II (6)

4. Year IV Courses
Disciplinary Electives (18 credits)

At least 18 credits from List A and List B, with at least 12 credits from List A:
List A

STAT3951 Advanced contingencies (6)
STAT3954 Current topics in actuarial science (6)
STAT3955 Survival analysis (6)
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<td>STAT4902</td>
<td>Selected topics in actuarial science (6)</td>
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</table>

### 5. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

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<td>STAT4711</td>
<td>Capstone experience for actuarial science undergraduates (6)</td>
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### Notes:
1. Students are expected to be in full-time status for eight academic semesters (in addition to their 6-month or longer full-time internships) in order to fulfill the degree requirements.

2. Students may optionally take Majors or Minors outside the BSc(ActuarSc) programme, provided that they fully satisfy the requirements.

### Remarks:
Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the programme in order to satisfy the degree graduation requirements.
Programme Title  BSc in Actuarial Science
Offered to students admitted to Year 1 in 2015

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.

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<td>MATH1821</td>
<td>Mathematical methods for actuarial science I</td>
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<td>MATH2822</td>
<td>Mathematical methods for actuarial science II</td>
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<tr>
<td>STAT2901</td>
<td>Probability and statistics: foundations of actuarial science</td>
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<td>STAT2902</td>
<td>Financial mathematics</td>
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2. Year II Courses
Disciplinary Core Courses (42 credits)

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<tr>
<td>STAT3901</td>
<td>Life contingencies</td>
<td>6</td>
</tr>
<tr>
<td>STAT3902</td>
<td>Statistical models</td>
<td>6</td>
</tr>
<tr>
<td>STAT3903</td>
<td>Stochastic models</td>
<td>6</td>
</tr>
<tr>
<td>STAT3904</td>
<td>Corporate finance for actuarial science</td>
<td>6</td>
</tr>
<tr>
<td>STAT3905</td>
<td>Introduction to financial derivatives</td>
<td>6</td>
</tr>
<tr>
<td>STAT3906</td>
<td>Risk theory I</td>
<td>6</td>
</tr>
</tbody>
</table>

3. Year III Courses
Disciplinary Core Courses (30 credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT3907</td>
<td>Linear models and forecasting</td>
<td>6</td>
</tr>
<tr>
<td>STAT3908</td>
<td>Credibility theory and loss distributions</td>
<td>6</td>
</tr>
<tr>
<td>STAT3909</td>
<td>Advanced life contingencies</td>
<td>6</td>
</tr>
<tr>
<td>STAT3910</td>
<td>Financial economics I</td>
<td>6</td>
</tr>
<tr>
<td>STAT3911</td>
<td>Financial economics II</td>
<td>6</td>
</tr>
</tbody>
</table>

4. Year IV Courses
Disciplinary Electives (18 credits)
At least 18 credits from List A and List B, with at least 12 credits from List A:

List A

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT3951</td>
<td>Advanced contingencies</td>
<td>6</td>
</tr>
<tr>
<td>STAT3954</td>
<td>Current topics in actuarial science</td>
<td>6</td>
</tr>
<tr>
<td>STAT3955</td>
<td>Survival analysis</td>
<td>6</td>
</tr>
<tr>
<td>STAT3956</td>
<td>Pension funds and pension mathematics</td>
<td>6</td>
</tr>
<tr>
<td>STAT4607</td>
<td>Credit risk analysis</td>
<td>6</td>
</tr>
<tr>
<td>STAT4608</td>
<td>Market risk analysis</td>
<td>6</td>
</tr>
<tr>
<td>STAT4901</td>
<td>Risk theory II</td>
<td>6</td>
</tr>
<tr>
<td>STAT4903</td>
<td>Actuarial techniques for general insurance</td>
<td>6</td>
</tr>
</tbody>
</table>
### List B

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT3602</td>
<td>Statistical inference</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3612</td>
<td>Data mining</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3616</td>
<td>Advanced SAS programming</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3953</td>
<td>Fundamentals of actuarial practice</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT4602</td>
<td>Multivariate data analysis</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT4902</td>
<td>Selected topics in actuarial science</td>
<td>(6)</td>
</tr>
</tbody>
</table>

5. **Capstone requirement (6 credits)**

At least 6 credits selected from the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Capstone experience for actuarial science undergraduates</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT4767</td>
<td>Actuarial science internship</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT4798</td>
<td>Statistics and actuarial science project</td>
<td>(6)</td>
</tr>
</tbody>
</table>

### Notes:

1. Students are expected to be in full-time status for eight academic semesters (in addition to their 6-month or longer full-time internships) in order to fulfill the degree requirements.

2. Students may optionally take Majors or Minors outside the BSc(ActuarSc) programme, provided that they fully satisfy the requirements.

### Remarks:

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the programme in order to satisfy the degree graduation requirements.
Programme Title: BSc in Actuarial Science
Offered to students admitted to Year 1 in 2014

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

PLO 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)

PLO 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)

PLO 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)

PLO 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)

PLO 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)

PLO 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)

Impermissible Combinations:
Minor in Actuarial Studies

Required courses (138 credits)

1. Year I Courses
Disciplinary Core Courses (42 credits)
- ACCT1101 Introduction to financial accounting (6)
- ECON1210 Introductory microeconomics (6)
- ECON1220 Introductory macroeconomics (6)
- MATH1821 Mathematical methods for actuarial science I (6)
- MATH2822 Mathematical methods for actuarial science II (6)
- STAT2901 Probability and statistics: foundations of actuarial science (6)
- STAT2902 Financial mathematics (6)

2. Year II Courses
Disciplinary Core Courses (42 credits)
- COMP1117 Computer programming (6)
- STAT3901 Life contingencies (6)
- STAT3902 Statistical models (6)
- STAT3903 Stochastic models (6)
- STAT3904 Corporate finance for actuarial science (6)
- STAT3905 Introduction to financial derivatives (6)
- STAT3906 Risk theory I (6)

3. Year III Courses
Disciplinary Core Courses (30 credits)
- STAT3907 Linear models and forecasting (6)
- STAT3908 Credibility theory and loss distributions (6)
- STAT3909 Advanced life contingencies (6)
- STAT3910 Financial economics I (6)
- STAT3911 Financial economics II (6)

4. Year IV Courses
Disciplinary Electives (18 credits)
At least 18 credits from List A and List B, with at least 12 credits from List A:

List A
- STAT3951 Advanced contingencies (6)
- STAT3954 Current topics in actuarial science (6)
- STAT3955 Survival analysis (6)
- STAT3956 Pension funds and pension mathematics (6)
- STAT4607 Credit risk analysis (6)
- STAT4608 Market risk analysis (6)
- STAT4901 Risk theory II (6)
- STAT4903 Actuarial techniques for general insurance (6)

List B
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT3602</td>
<td>Statistical inference</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3612</td>
<td>Data mining</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3616</td>
<td>Advanced SAS programming</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3953</td>
<td>Fundamentals of actuarial practice</td>
<td>(6)</td>
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<td>STAT4602</td>
<td>Multivariate data analysis</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT4902</td>
<td>Selected topics in actuarial science</td>
<td>(6)</td>
</tr>
</tbody>
</table>

5. **Capstone requirement (6 credits)**

At least 6 credits selected from the following courses:

- STAT4711  Capstone experience for actuarial science undergraduates (6)  
- STAT4767  Actuarial science internship (6)  
- STAT4798  Statistics and actuarial science project (6)  

**Notes:**

1. Students are expected to be in full-time status for eight academic semesters (in addition to their 6-month or longer full-time internships) in order to fulfill the degree requirements.
2. Students may optionally take Majors or Minors outside the BSc(ActuarSc) programme, provided that they fully satisfy the requirements.

**Remarks:**

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the programme in order to satisfy the degree graduation requirements.
Programme Title: BSc in Actuarial Science
Offered to students admitted to Year 1 in 2013

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

PLO 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)

PLO 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)

PLO 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)

PLO 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)

PLO 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)

PLO 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)

Impermissible Combinations:
Minor in Actuarial Studies

Required courses (138 credits)

1. Year I Courses
Disciplinary Core Courses (42 credits)
ACCT1101 Introduction to financial accounting (6)
ECON1210 Introductory microeconomics (6)
ECON1220 Introductory macroeconomics (6)
MATH1821 Mathematical methods for actuarial science I (6)
MATH2822 Mathematical methods for actuarial science II (6)
STAT2901 Probability and statistics: foundations of actuarial science (6)
STAT2902 Financial mathematics (6)

2. Year II Courses
Disciplinary Core Courses (42 credits)
COMP1117 Computer programming (6)
STAT3901 Life contingencies (6)
STAT3902 Statistical models (6)
STAT3903 Stochastic models (6)
STAT3904 Corporate finance for actuarial science (6)
STAT3905 Introduction to financial derivatives (6)
STAT3906 Risk theory I (6)

3. Year III Courses
Disciplinary Core Courses (30 credits)
STAT3907 Linear models and forecasting (6)
STAT3908 Credibility theory and loss distributions (6)
STAT3909 Advanced life contingencies (6)
STAT3910 Financial economics I (6)
STAT3911 Financial economics II (6)

4. Year IV Courses
Disciplinary Electives (18 credits)
At least 18 credits from List A and List B, with at least 12 credits from List A:

List A
STAT3951 Advanced contingencies (6)
STAT3954 Current topics in actuarial science (6)
STAT3955 Survival analysis (6)
STAT3956 Pension funds and pension mathematics (6)
STAT4607 Credit risk analysis (6)
STAT4608 Market risk analysis (6)
STAT4901 Risk theory II (6)

List B
STAT4903 Actuarial techniques for general insurance (6)
### BSc(ActuarSc) Programme

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT3602</td>
<td>Statistical inference</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3612</td>
<td>Data mining</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3616</td>
<td>Advanced SAS programming</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3953</td>
<td>Fundamentals of actuarial practice</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT4602</td>
<td>Multivariate data analysis</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT4902</td>
<td>Selected topics in actuarial science</td>
<td>(6)</td>
</tr>
</tbody>
</table>

**5. Capstone requirement (6 credits)**

*At least 6 credits selected from the following courses:*

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT4711</td>
<td>Capstone experience for actuarial science undergraduates</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT4767</td>
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<tr>
<td>STAT4798</td>
<td>Statistics and actuarial science project</td>
<td>(6)</td>
</tr>
</tbody>
</table>

**Notes:**

1. Students are expected to be in full-time status for eight academic semesters (in addition to their 6-month or longer full-time internships) in order to fulfill the degree requirements.

2. Students may optionally take Majors or Minors outside the BSc(ActuarSc) programme, provided that they fully satisfy the requirements.

3. The course title of ECON1210 Introductory microeconomics in 2013-14 or before is Introduction to economics I.

4. The course title of ECON1220 Introductory macroeconomics in 2013-14 or before is Introduction to economics II.

**Remarks:**

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the programme in order to satisfy the degree graduation requirements.
Programme Title: BSc in Actuarial Science
Offered to students admitted to Year 1 in 2012

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

- **PLO 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)
- **PLO 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)
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- **PLO 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)

Impermissible Combinations:
Minor in Actuarial Studies

Required courses (138 credits)

1. **Year I Courses**
   - Disciplinary Core Courses (42 credits)
     - ACCT1101 Introduction to financial accounting (6)
     - ECON1210 Introductory microeconomics (6)
     - ECON1220 Introductory macroeconomics (6)
     - MATH1821 Mathematical methods for actuarial science I (6)
     - MATH2822 Mathematical methods for actuarial science II (6)
     - STAT2901 Probability and statistics: foundations of actuarial science (6)
     - STAT2902 Financial mathematics (6)

2. **Year II Courses**
   - Disciplinary Core Courses (42 credits)
     - COMP1117 Computer programming (6)
     - STAT3901 Life contingencies (6)
     - STAT3902 Statistical models (6)
     - STAT3903 Stochastic models (6)
     - STAT3904 Corporate finance for actuarial science (6)
     - STAT3905 Introduction to financial derivatives (6)
     - STAT3906 Risk theory I (6)

3. **Year III Courses**
   - Disciplinary Core Courses (30 credits)
     - STAT3907 Linear models and forecasting (6)
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     - STAT3910 Financial economics I (6)
     - STAT3911 Financial economics II (6)

4. **Year IV Courses**
   - Disciplinary Electives (18 credits)
     - At least 18 credits from List A and List B, with at least 12 credits from List A:
       - **List A**
         - STAT3951 Advanced contingencies (6)
         - STAT3954 Current topics in actuarial science (6)
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<thead>
<tr>
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<th>Course Title</th>
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</thead>
<tbody>
<tr>
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<td>(6)</td>
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<td>Advanced SAS programming</td>
<td>(6)</td>
</tr>
<tr>
<td>STAT3952</td>
<td>Investment and asset management</td>
<td>(6)</td>
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<td>STAT3953</td>
<td>Fundamentals of actuarial practice</td>
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</tr>
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<td>STAT4902</td>
<td>Selected topics in actuarial science</td>
<td>(6)</td>
</tr>
</tbody>
</table>

5. **Capstone requirement (6 credits)**

At least 6 credits selected from the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
</tr>
</thead>
<tbody>
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<td>Statistics and actuarial science project</td>
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</table>

**Notes:**

1. Students are expected to be in full-time status for eight academic semesters (in addition to their 6-month or longer full-time internships) in order to fulfill the degree requirements.

2. Students may optionally take Majors or Minors outside the BSc(ActuarSc) programme, provided that they fully satisfy the requirements.

3. The course title of ECON1210 Introductory microeconomics in 2013-14 or before is Introduction to economics I.

4. The course title of ECON1220 Introductory macroeconomics in 2013-14 or before is Introduction to economics II.

**Remarks:**

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the programme in order to satisfy the degree graduation requirements.
CAES1000  
Core University English (6 credits)  
Academic Year 2017

Offering Department  
English

Quota  
---

Course Co-ordinator  
Dr N Fong, English (fongsn@hku.hk)

(Dr N Fong,Centre for Applied English Studies)

Course Objectives  
The Core University English (CUE) course aims to enhance first-year students’ academic English language proficiency in the university context. CUE focuses on developing students' academic English language skills for the Common Core Curriculum. These include the language skills needed to understand and produce spoken and written academic texts, express academic ideas and concepts clearly and in a well-structured manner and search for and use academic sources of information in their writing and speaking. Four online-learning modules through the Moodle platform on academic speaking, academic grammar, academic vocabulary, citation and referencing skills and avoiding plagiarism will be offered to students to support their English learning. This course will help students to participate more effectively in their first-year university studies in English, thereby enriching their first-year experience.

Course Contents & Topics  
- On successful completion of this course, students should be able to:
  - CLO 1 identify and distinguish between main ideas and supporting details in lectures and written texts and demonstrate an understanding of the arguments / facts expressed
  - CLO 2 form and express personal opinions through critical reading and listening
  - CLO 3 argue for and defend a position in a clear and structured way using academic sources, through writing and speaking
  - CLO 4 demonstrate control of grammatical accuracy and lexical appropriacy in academic communication

Pre-requisites (and Co-requisites and Impermissible combinations)  
NIL

Course to PLO Mapping  
Offer in 2018 - 2019: Y

Grade Descriptors (A+ to F)  

<table>
<thead>
<tr>
<th>Grade</th>
<th>Course Grade (%)</th>
<th>Products and productive skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excellent</td>
<td>Spoken and written academic texts are appropriately structured. Students can clearly and concisely explain academic concepts and critically argue for a detailed position. Students always use appropriate academic sources to support their ideas in writing and speaking. They cite and reference correctly at all times. Students demonstrate an ability to fully comprehend and critically interpret spoken and written texts. Written language contains very few, if any, systematic errors in grammar and vocabulary. Spoken language is always comprehensible and fluent.</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>Spoken and written academic texts are appropriately structured with only minor errors. Students can almost always clearly and concisely explain academic concepts and almost always critically argue for a detailed position. Students almost always use appropriate academic sources to support their ideas in writing and speaking. They cite and reference correctly with only a few non-systematic errors. Students can comprehend and interpret texts with ease, although they may miss some implied meanings and opinions. Written language is mostly accurate but contains a few systematic errors in complex grammar and vocabulary. Spoken language is mostly comprehensible and fluent.</td>
</tr>
<tr>
<td>C</td>
<td>Satisfactory</td>
<td>Spoken and written academic texts are sometimes not-well structured but there is some evidence of this ability. Students are sometimes unable to clearly and concisely explain academic concepts. While they can argue for a position, it is not very detailed and tend to be simplistic rather than critical. Students sometimes use sources which are nonacademic and/or not appropriate to support their ideas in writing and speaking. There are some systematic errors in citation and referencing but also evidence of correct systematic use. Students have some difficulty comprehending and critically interpreting texts. They can always understand the main ideas but may miss some of the writer’s views and attitudes. Written language is sometimes inaccurate, although errors, when they occur, are often in complex grammar and vocabulary and there is some evidence of control of simple grammatical structures. Spoken language is generally comprehensible and fluent but at times places strain on the listener.</td>
</tr>
<tr>
<td>D</td>
<td>Barely satisfactory</td>
<td>Spoken and written academic texts produced by students are often inappropriately structured but there may be some evidence of this ability. Students are often unable to clearly and concisely explain academic concepts and argue for a position. There is some evidence of an ability to explain academic concepts but not to critically argue for a position. Students often use sources which are nonacademic and/or not appropriate to support their ideas in writing and speaking. There are many systematic errors in citation and referencing however there is evidence of an understanding of some of the conventions of citation and referencing. Students often have difficulty comprehending and interpreting texts, sometimes failing to understand the main ideas and writer’s views and attitudes. Written language is often inaccurate containing errors in a range of simple and complex grammar and vocabulary. Spoken language is only sometimes comprehensible and fluent, and strain is frequently placed on the listener.</td>
</tr>
</tbody>
</table>

Course Type  
Lecture-based course

Course Teaching & Learning Activities  

<table>
<thead>
<tr>
<th>Activities</th>
<th>Details</th>
<th>No. of Hours</th>
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</thead>
<tbody>
<tr>
<td>Lectures</td>
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</tr>
<tr>
<td>Tutorials</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Reading / Self study</td>
<td>84</td>
<td></td>
</tr>
</tbody>
</table>

Assessment Methods and Weighing  

<table>
<thead>
<tr>
<th>Methods</th>
<th>Details</th>
<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Course Objectives
This six credit English-in-the-Discipline course will be offered to second year students studying in the Science Faculty. This course will help students develop the necessary skills to use both written and spoken English within their studies. Students will learn to better communicate and spontaneously discuss general and scientific concepts within their division, with other scientists as well as to a larger audience. Particular emphasis will be placed on enabling students to identify their own language needs and develop appropriate self-learning strategies to improve their proficiency.

### Course Contents & Topics
Topics covered in the course will be:
- Finding, evaluating and using appropriate academic source materials;
- Compiling an academic bibliography;
- Contrasting academic and popular genres of Science;
- Writing for a specific audience, including stance, shared knowledge, levels of formality; and
- Organizing and articulating ideas in an academically suitable format including appropriate vocabulary and grammar; and
- Critically examine their own language proficiency and analyze how that relates to their ability to perform successfully within their discipline. Developing self-directed learning strategies.

### Course Learning Outcomes
On successful completion of this course, students should be able to:

- CLO 1 identify and summarize disciplinary sources related to a specified topic
- CLO 2 produce texts (written and spoken) appropriate for a cross-disciplinary audience based on their disciplinary knowledge
- CLO 3 identify their own language learning needs and implement a plan to meet those needs

### Pre-requisites (and Co-requisites and Impermissible combinations)
NIL

### Course to PLO Mapping
<table>
<thead>
<tr>
<th>Offer in 2017 - 2018</th>
<th>Grade Descriptors (A to F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>1st sem 2nd sem Offer in 2018 - 2019 : Y</td>
</tr>
</tbody>
</table>

| A | Excellent result. Consistently demonstrates ability to summarize salient points accurately from appropriate and reliable sources using original language. Text uses sources appropriately and demonstrates accurate and appropriate grammatical, lexical and organizational characteristics. Language learning needs are clearly identified and aligned with evidence of planning, self-study and reflection. |
| B | Good to very good result. Usually demonstrates ability to summarize salient points accurately using mostly original language. Text mostly uses sources appropriately and demonstrates mostly accurate and appropriate grammatical, lexical and organizational characteristics. Language learning needs are stated with some reference to evidence of planning and reflection although there is some misalignment between goals and self-study completed. |
| C | Satisfactory to reasonably good result. Demonstrates some ability to summarize salient points using mostly original language although some inaccuracies are present. Text uses some sources appropriately and demonstrates appropriate but simple grammatical and lexical characteristics with some organizational flaws. Language learning needs are stated with some limited evidence of planning and reflection but goals and self-study are misaligned. |
| D | Barely satisfactory result. Demonstrates a limited ability to summarize salient points from sources with inaccuracies and little original language. Text uses sources inadequately and demonstrates grammatical inaccuracy, inappropriate lexical choices and organizational flaws. There is a minimal statement of language learning needs, planning and reflection with little or no apparent alignment between goals and self-study. |

### Examination
| No Exam |

### Course Type
Lecture-based course

### Course Teaching & Learning Activities
<table>
<thead>
<tr>
<th>Activities</th>
<th>Details</th>
<th>No. of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorials</td>
<td>seminars</td>
<td>36</td>
</tr>
<tr>
<td>Reading / Self study</td>
<td>independent learning work</td>
<td>120</td>
</tr>
</tbody>
</table>

### Assessment Methods and Weighting
<table>
<thead>
<tr>
<th>Methods</th>
<th>Details</th>
<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>independent learning work</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Essay</td>
<td>other genres of writing</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td></td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

### Required/recommended reading and online materials
Course materials to be provided electronically through course website.

### Course Website
http://caes.hku.hk/caes9820/

### Additional Course Information
This a compulsory course for all students studying undergraduate degrees in the Faculty of Science.
CSCI9001 Practical Chinese for science students (6 credits)  Academic Year  2017
Offering Department Chinese Quota ---
Teachers Involved Mr K W Wong, Chinese (kwongb@hku.hk)
Course Objectives This course aims to enhance the students’ competence using Chinese for professional communication. It helps the students to master the techniques of writing different types of documents such as memos, emails, letters, announcements, notice, brochures, leaflets, and reports. In addition, topics addressing presentation and discussion techniques, the style and rhetoric of reader-based writings are included to heighten the students’ linguistic sensitivity.
Course Contents & Topics - Grammar & vocabulary of modern Chinese - The Chinese writing system - Techniques of writing short messages: good-news and goodwill messages, bad-news messages, and persuasive messages - Techniques of writing electronic documents: emails; presentations - Styles and rhetoric of reader-based reports, proposals and presentations
Course Learning Outcomes On successful completion of this course, students should be able to:
CLO 1 develop a balanced competency in modern Chinese and write well-formed sentences
CLO 2 employ rhetorical devices and stylistics, as well as practical writing skills specific to their discipline
CLO 3 explore new tactics of communication, initiate discussions and debates and address new challenges
CLO 4 apply their disciplinary knowledge and their Chinese writing skills and professional presentation techniques analytically, critically and creatively in different social or professional discourses
Pre-requisites (and Co-requisites and Impermissible combinations) NIL
Course to PLO Mapping Offer in 2017 - 2018
Grade Descriptors (A+ to F)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The student acquired a superb ability to achieve the intended learning outcomes of the course at all levels of learning: describe, apply, evaluate, and synthesize the language techniques for effective communication in all situations.</td>
</tr>
<tr>
<td>B</td>
<td>The student acquired the ability to achieve the intended learning outcomes of the course at all levels of learning: describe, apply, evaluate, and synthesize the language techniques for effective communication in most situations.</td>
</tr>
<tr>
<td>C</td>
<td>The student acquired adequate ability to achieve the intended learning outcomes of the course at low levels of learning (i.e. describe and apply the language techniques for effective communication) but not at high levels of learning (i.e. evaluate and synthesize the language techniques for effective communication).</td>
</tr>
<tr>
<td>D</td>
<td>The student only has basic familiarity with the subject.</td>
</tr>
<tr>
<td>Fail</td>
<td>The student has very limited familiarity with the subject.</td>
</tr>
</tbody>
</table>

Course Type Lecture-based course

Course Teaching & Learning Activities Activities Details No. of Hours

<table>
<thead>
<tr>
<th>Activities</th>
<th>Details</th>
<th>No. of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Tutorials</td>
<td>Small group tutorials</td>
<td>12</td>
</tr>
<tr>
<td>Group work</td>
<td>Workshops</td>
<td>24</td>
</tr>
<tr>
<td>Discussion</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Reading / Self study</td>
<td>Reading/self study (20 hours) and preparation (12 hours)</td>
<td>32</td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Assessment Methods to CLO Mapping

<table>
<thead>
<tr>
<th>Methods</th>
<th>Details</th>
<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Self-access &amp; online exercises (40%) and Tutorial discussion (10%)</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td></td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Required/recommended reading and online materials

### MATH1821: Mathematical methods for actuarial science I (6 credits)

**Academic Year:** 2017  
**Offering Department:** Mathematics  
**Quota:** ---  
**Course Co-ordinator:** Dr J T Chan, Mathematics (jtchan@hku.hk)

### Course Objectives
This course is the first of the two mathematics courses designed to provide actuarial science students with a solid background of calculus of one and several variables and an introduction to linear algebra. The course focuses on single variable calculus and elementary matrix theory. It aims at students with Core Mathematics plus Module 1 or Core Mathematics plus Module 2 background.

### Course Contents & Topics
- Functions; graphs; inverse functions.
- Limits, continuity and differentiability.
- Mean value theorem; implicit differentiation; L'Hopital's rule.
- Bisection method and Newton's method.
- Higher order derivatives, maxima and minima, graph sketching.
- Taylor approximation and error estimation.
- Improper integrals, partial fractions, integration by parts.
- Numerical integration, Trapezoidal rule and Simpson's rule.
- Basic matrix and vector (of orders 2 and 3) operations, determinants.
- Simple differential equations.

### Course Learning Outcomes
On successful completion of this course, students should be able to:

- CLO 1 describe properties of a function and an inverse function
- CLO 2 evaluate various kinds of limits, and determine continuity and differentiability of functions.
- CLO 3 apply advanced rules/techniques of differentiation and integration to compute derivatives and integrals; sketch graphs of functions
- CLO 4 approximate integrals by numerical methods
- CLO 5 perform matrix and vector operations, compute determinants
- CLO 6 solve simple first and second order ordinary differential equations

### Pre-requisites and Impermissible combinations
- **Level 4 or above in HKDSE Mathematics plus Module 1, or Level 4 or above in HKDSE Mathematics plus Module 2, or equivalent; and Not for students who have passed MATH1013 or (MATH1851 and MATH1853), or have already enrolled in these courses. For BSc(ActuarSc) students only.

### Course Website
moodle.hku.hk

### Additional Course Information
- **Tutorial timetable:** http://hkumath.hku.hk/~math/Timetable/tutorials1718_S1.pdf
- **Required/recommended reading and online materials:**
  - George B. Thomas; as revised by Maurice D. Weir and Joel Hass: Thomas' Calculus (Addison Wesley, 12th edition)
  - Steven J. Leon: Linear Algebra with Applications (Pearson Prentice Hall)
- **Department of Mathematics**
- **Course Website**
  - moodle.hku.hk
MATH2822 Mathematical methods for actuarial science II (6 credits)  

**Offering Department:** Mathematics  
**Quota:** ---  

**Course Co-ordinator:** Dr J T Chan, Mathematics (jtchan@hku.hk)  

**Course Objectives:** This course is the second of the two mathematics courses designed to provide actuarial science students with a solid background of calculus of one and several variables and an introduction to linear algebra. The course focuses on multivariable calculus and linear algebra. It aims at students with MATH1821. It can be followed by other 2000 or 3000 level mathematics courses.

**Course Contents & Topics:**  
- Matrices, systems of linear equations, determinants.  
- Eigenvalues and eigenvectors, diagonalization of matrices.  
- Quadratic functions and their standard forms.  
- Vector spaces and subspaces.  
- Functions of several variables; partial differentiation.  
- Gradients and directional derivatives.  
- Taylor approximation, Newton's method.  
- Maxima and minima, Lagrange multipliers.  
- Double and triple integrals, areas and volumes.

**Course Learning Outcomes:** On successful completion of this course, students should be able to:  
CLO 1 understand and recognize various topics in linear algebra such as the basic arithmetic of matrices, determinants, systems of linear equations, eigenvalues and eigenvectors, diagonalizable matrices, basis and dimension, and the rank-nullity theorem.  
CLO 2 understand and recognize various topics in functions of several variables including partial differentiation, the Hessian test for local extrema, vector-valued functions, Jacobians, the method of Lagrange multipliers, double/triple integrals and the change of variable formula.

**Pre-requisites (and Co-requisites and Impermissible combinations):** Pass in MATH1821.  
For BSc(ActuarSc) students only.

**Offer in 2017 - 2018:** Y  
**Y 2nd sem**  
**Offer in 2018 - 2019:** Y  
**Examination:** May

**Grade Descriptors (A+ to F):**
A  
Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.

B  
Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.

C  
Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.

D  
Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.

Fail  
Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.

**Course Type:** Lecture-based course

**Course Teaching & Learning Activities:**
- Lectures 36
- Tutorials 12
- Reading / Self study 100

**Assessment Methods and Weighting:**

<table>
<thead>
<tr>
<th>Methods</th>
<th>Details</th>
<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination</td>
<td></td>
<td>50</td>
<td>CLO 1,2</td>
</tr>
<tr>
<td>Test</td>
<td>2 tests</td>
<td>50</td>
<td>CLO 1,2</td>
</tr>
</tbody>
</table>

**Required/recommended reading and online materials:**  
George B. Thomas; as revised by Maurice D. Weir and Joel Hass: Thomas' Calculus (Addison Wesley, 12th edition)  
Steven J. Leon: Linear Algebra with Applications (Pearson Prentice Hall)

**Course Website:** moodle.hku.hk

**Additional Course Information:**  
Tutorial timetable:  
http://hkumath.hku.hk/~math/Timetable/tutorials1718_S2.pdf
STAT2901

**Offering Department**  
Statistics & Actuarial Science

**Course Co-ordinator**  
Dr C W Kwan, Statistics & Actuarial Science (ckw02@hku.hk)

**Teachers Involved**  
Dr C W Kwan, Statistics & Actuarial Science

**Course Contents & Topics**  
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.

**Course Objectives**  
On successful completion of this course, students should be able to:
- CLO 1 understand the mathematical theory underlying the modern practice of statistics
- CLO 2 develop skills in probabilistic analysis for problems involving randomness
- CLO 3 apply techniques in probability and statistics to solve actuarial science problems

**Grade Descriptors (A+ to F)**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Demonstrates thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presenntational skills.</td>
</tr>
<tr>
<td>B</td>
<td>Demonstrates substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presenntational skills.</td>
</tr>
<tr>
<td>C</td>
<td>Demonstrates general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presenntational skills.</td>
</tr>
<tr>
<td>D</td>
<td>Demonstrates partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presenntational skills.</td>
</tr>
<tr>
<td>Fail</td>
<td>Demonstrates little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presenntational skills are minimally effective or ineffective.</td>
</tr>
</tbody>
</table>

**Assessment Methods and Weighting**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Details</th>
<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Coursework (assignments, tutorials, and a class test)</td>
<td>25</td>
<td>CLO 1,2,3</td>
</tr>
<tr>
<td>Examination</td>
<td>One 3-hour written examination</td>
<td>75</td>
<td>CLO 1,2,3</td>
</tr>
</tbody>
</table>

**Required/recommended reading and online materials**


**Course Website**
moodle.hku.hk

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STAT2902

**Offering Department**  
Statistics & Actuarial Science

**Course Co-ordinator**  
Prof K C Yuen, Statistics & Actuarial Science (kcyuen@hku.hk)

**Teachers Involved**  
Prof K C Yuen, Statistics & Actuarial Science

**Course Objectives**  
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.

**Course Contents & Topics**  
Key topics include: measurement of interest, annuities certain; discounted cash flow analysis; yield rates; amortization schedules and sinking funds; bonds and related securities; practical applications such as real estate mortgage and short sales; stochastic approaches to interest; and key terms of financial analysis such as yield curves, spot rates, forward rates, duration, convexity, and immunization.

**Course Learning Outcomes**  
On successful completion of this course, students should be able to:
- CLO 1 understand the fundamental concepts of financial mathematics
Course Website: moodle.hku.hk

STAT3602: Statistical inference (6 credits)
Offering Department: Statistics & Actuarial Science
Course Co-ordinator: Prof S M S Lee, Statistics & Actuarial Science (smslee@hku.hk)
Teachers Involved: (Prof S M S Lee, Statistics & Actuarial Science)
Course Objectives:
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 pursue research studies in statistics and related areas.

Course Contents & Topics:
1. Paradigms of inference: frequentist, Bayesian, Fisherian.
2. Decision theory: loss function, risk, decision rule, admissibility; minimaxity, unbiasedness; Bayes' rule.
3. Estimation theory: exponential families; likelihood; sufficiency; minimal sufficient; ancillarity; completeness; UMVU estimators; information inequality; large-sample theory of maximum likelihood estimation.
4. Hypothesis testing: uniformly most powerful test; monotone likelihood ratio; unbiasedness; UMP unbiased test; maximal invariants; most powerful invariant test; large-sample theory of likelihood ratio.

Course Learning Outcomes:
On successful completion of this course, students should be able to:
CLO 1 form a panoramic view of classical developments in mathematical statistics
CLO 2 gain thorough insight into the essentials of statistical inference
CLO 3 build a solid foundation for future research studies in statistics and related areas

Pre-requisites (and Co-requisites and Impermissible combinations):
Pass in STAT2602 or STAT3902

Offer in 2017 - 2018
Y 2nd sem Offer in 2018 - 2019: Y
Grade Descriptors (A+ to F)
A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presential skills.
B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presential skills.
C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presential skills.
D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presential skills.
Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentional skills are minimally effective or ineffective.

Assessment Methods and Weighting
Assignments Coursework (assignments, tutorials, and class test(s)) 25 CLO 1,2,3,4,5,6
Examination One 3-hour written examination 75 CLO 1,2,3,4,5,6

Required/recommended reading and online materials

On successful completion of this course, students should be able to:
CLO 1 learn standard actuarial notations for a variety of annuities
CLO 2 do simple discounted cashflow analysis using basic annuities
CLO 3 learn the operations of some commonly-encountered financial instruments such as bonds, mortgages, short sales, and so on
CLO 4 quote interest in various modes and determine interest rate based on a series of financial transactions
CLO 5 deal with Exam FM of the Society of Actuaries
CLO 6 understand general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presential skills.

CLO 2, CLO 3, CLO 4, CLO 5, CLO 6
STAT3612 Data mining (6 credits)  

Academic Year 2017  

Offering Department Statistics & Actuarial Science  
Quota 50  

Course Co-ordinator Dr A J Zhang, Statistics & Actuarial Science (ajzhang@hku.hk)  

Course Objectives  
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 and 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.

Course Contents & Topics  
Data pre-processing, classification and regression trees, credit scoring, kNN classifier, cluster analysis and neural networks.

Course Learning Outcomes  
On successful completion of this course, students should be able to:

- CLO 1 implement data mining process summarized in the acronym SEMMA which stands for sampling, exploring, modifying, modeling, and assessing data.
- CLO 2 understand and apply a wide range of data mining techniques, and recognize their characteristics, strengths and weaknesses.
- CLO 3 be proficient with the leading data mining software—SAS Enterprise Miner.
- CLO 4 identify and use appropriate data mining techniques for a data mining project, taking into account both the nature of the data to be mined and the goals of the user of the discovered knowledge.
- CLO 5 evaluate the quality of discovered knowledge, taking into account the requirements of the data mining task being solved and the goals of the user.

Pre-requisites (and Co-requisites and Impermissible combinations)  
Pass in STAT2602 or (STAT1603 and any University level 2 course) or STAT3902; and Pass in STAT3800 or STAT3907, or already enrolled in these courses.

Offer in 2017 - 2018  
Y 2nd sem  

Grade-Descriptors (A to F)  
A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.
B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.
C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.
D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.
Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

Course Type  
Lecture-based course  

Activities  
Details  
No. of Hours  
Lectures 36  
Tutorials 12  
Reading / Self study 100  

Assessment Methods and Weighting  
Methods  
Details  
Weighting in final course grade (%)  
Assessment Methods to CLO Mapping  
Assignments 30 CLO 1,2,3  
Project reports 30 CLO 1,2,3,4,5  
Test 40 CLO 2,3  

Required/recommended reading and online materials  
Tan, P. N., Steinbach, M. and Kumar, V.: Introduction to Data Mining (Addison Wesley, 2014, 3rd edition)  
J. Han & M. Kamber: Data Mining: Concepts and Techniques (Morgan Kaufmann, 2011, 3rd edition)  
Larose, D. T.: Discovering Knowledge in Data: An Introduction to Data Mining (Wiley, 2005).

Course Website http://moodle.hku.hk
Advanced SAS programming (6 credits)

Offering Department: Statistics & Actuarial Science
Course Co-ordinator: TBC, Statistics & Actuarial Science (tbc@hku.hk)

Course Objectives:
This course aims to equip students, who have taken STAT2603, with a high level of proficiency in SAS programming for automation of procedures and data processing in solving complex problems more efficiently.

Course Contents & Topics:
Overview of SAS underlying parts. Macro programming. Advanced programming techniques including data simulation, advanced data look-up techniques, modifying transaction datasets and controlling I/O processing and memory.

Course Learning Outcomes:
On successful completion of this course, students should be able to:

- CLO 1 Understand the system of SAS and basic programming
- CLO 2 Use the BY statement for parallel processing to aid automation
- CLO 3 Use the output dataset without printing to OUTPUT windows for piping idea in automation
- CLO 4 Use SAS MACRO to develop customized and automated applications
- CLO 5 Use advanced SAS programming statements and techniques to solve complex problems

Pre-requisites (and Co-requisites and Impermissible combinations):
Pass in STAT2601 or STAT2901

Offer in 2017 - 2018:
- Offer in 2018 - 2019: Y
- Examination: ---

Grade Descriptors (A+ to F):
- A: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.
- B: Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.
- C: Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.
- D: Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.
- F: Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

Course Type: Lecture-based course

Course Teaching & Learning Activities:
- Activities: Details: No. of Hours
  - Lectures: 36
  - Tutorials: 12
  - Reading / Self study: 100

Assessment Methods and Weighting:
- Methods: Details: Weighting in final course grade (%): Assessment Methods to CLO Mapping
  - Assignments: Coursework (assignments, tutorials, and a class test): 50: CLO 1, 2, 3, 4, 5
  - Examination: One 2-hour written examination: 50: CLO 1, 2, 3, 4, 5

Required/recommended reading and online materials:
- moodle.hku.hk

STAT3901

Life contingencies (6 credits)

Offering Department: Statistics & Actuarial Science
Course Co-ordinator: Prof K C Yuen, Statistics & Actuarial Science (kcyuen@hku.hk)

Course Objectives:
The major objectives of this course are to integrate life contingencies into a full probabilistic framework. The time-until-death random variable is the basic building block by which models for life insurances, designed to reduce the financial impact of the random event of untimely death, are developed. This course introduces the concepts of life contingencies and the basic mathematical skills for modelling life insurances products.

Course Contents & Topics:
Key topics include: survival distributions; life table functions; select and ultimate tables; life insurance models; life annuity models; loss-at-issue random variable; benefit premiums.

Course Learning Outcomes:
On successful completion of this course, students should be able to:

- CLO 1 calculate the expected values, variances, probabilities, and percentiles for survival-time random variables
- CLO 2 define the continuous survival-time random variable that arises from the discrete survival-time random variable using some assumptions for fractional ages
- CLO 3 define present-value-of-benefit random variables defined on survival-time random variables
- CLO 4 define and calculate the expected values, variances and probabilities for present-value-of-benefit random variables, present-value-of-loss-at-issue random variables, and present-value-of-loss random variables
- CLO 5 calculate benefit premiums for life insurances and annuities

Pre-requisites (and Co-requisites and Impermissible combinations):
(Pass in STAT2602 and STAT361) or (Pass in STAT2902 and (Pass in STAT3902 or already enrolled in this course)) or (Pass in STAT2602 and STAT2902)

Offer in 2017 - 2018:
- Y: 1st sem
- Offer in 2018 - 2019: Y
- Examination: Dec

Grade Descriptors (A+ to F):
- A: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability...
Department of Statistics & Actuarial Science

Course Type
Lecture-based course

Course Teaching & Learning Activities
<table>
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<tr>
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Assessment Methods and Weighting
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<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Coursework (assignments, tutorials, and a class test)</td>
<td>25</td>
<td>CLO 1,2,3,4,5</td>
</tr>
<tr>
<td>Examination</td>
<td>One 3-hour written examination</td>
<td>75</td>
<td>CLO 1,2,3,4,5</td>
</tr>
</tbody>
</table>

Required/recommended reading and online materials

Course Website
moodle.hku.hk

Course Details

**Offering Department**
Statistics & Actuarial Science

**Course Number**
STAT3902

**Course Name**
Statistical models (6 credits)

**Academic Year**
2017

**Quota**
---

**Course Co-ordinator**
Dr G C S Lui, Statistics & Actuarial Science (csglui@hku.hk)

**Course Objectives**
This course is on the basis of ‘STAT2901 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.

**Course Contents & Topics**
Distribution and density of function of random variables; Order statistics, central limit theorem, Maximum likelihood estimator (MLE), moment estimator, Bayesian estimator, properties of estimators, limiting properties of MLE; Confidence interval estimations for normal mean, the difference of two normal means, normal variance, the ratio of two normal variances, and large-sample confidence intervals; Power function, Neyman-Pearson Lemma, likelihood ratio test, and goodness of fit test.

**Course Learning Outcomes**
On successful completion of this course, students should be able to:

- CLO 1 understand the importance of sufficient statistic(s) in data reduction and statistical inferences such as point estimation, confidence interval estimation, and testing hypothesis
- CLO 2 derive maximum likelihood estimators of parameters to calculate maximum likelihood estimates
- CLO 3 locate pivotal quantity to construct confidence intervals of parameters
- CLO 4 find testing statistic to test hypotheses associated with one-sample and/or two-sample normal distributions with small sample sizes and non-normal distributions with large sample sizes

**Pre-requisites (and Co-requisites and Impermissible combinations)**
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.

**Offer in 2017 - 2018**
Y 1st sem Offer in 2018 - 2019: Y

**Examination**

<table>
<thead>
<tr>
<th>Grade Descriptors (A+ to F)</th>
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<th>Weighting in final course grade (%)</th>
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<td>D</td>
<td>Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.</td>
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</tr>
<tr>
<td>Fail</td>
<td>Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.</td>
<td></td>
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</tbody>
</table>

**Course Type**
Lecture-based course

**Course Teaching & Learning Activities**
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<tr>
<th>Activities</th>
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<td>Reading / Self study</td>
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</table>

**Assessment Methods and Weighting**
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<td>Assignments</td>
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<td>CLO 1,2,3,4</td>
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<td>Examination</td>
<td>One 3-hour written examination</td>
<td>75</td>
<td>CLO 1,2,3,4</td>
</tr>
</tbody>
</table>

**Required/recommended reading and online materials**
Course Website: moodle.hku.hk

STAT3903: Stochastic models (6 credits)

<table>
<thead>
<tr>
<th>Course Co-ordinator</th>
<th>Prof J J F Yao, Statistics &amp; Actuarial Science (<a href="mailto:jeffyao@hku.hk">jeffyao@hku.hk</a>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers Involved</td>
<td>(Prof J J F Yao, Statistics &amp; Actuarial Science)</td>
</tr>
<tr>
<td>Course Objectives</td>
<td>This is an introductory course in probability modelling. A range of important topics in stochastic processes will be discussed.</td>
</tr>
<tr>
<td>Course Contents &amp; Topics</td>
<td>Introduction to probability theory, Conditional probability and expectation, Markov chains, random walk models, classification of states in a Markov chain, calculation of limiting probabilities and mean time spent in transient states, Poisson process, distribution of inter-arrival time and waiting time, conditional distribution of the arrival time, Brownian Motion, hitting time and maximum variable, geometric Brownian motion, the Black-Scholes option pricing formula, Gaussian bridge, and stationary processes. Birth-and-death process, branching process and renewal process may also be covered (if time permits).</td>
</tr>
<tr>
<td>Pre-requisites</td>
<td>Pass in STAT2901; and</td>
</tr>
<tr>
<td></td>
<td>For BSc(Actuarial Science) students only;</td>
</tr>
<tr>
<td>Grade Descriptors</td>
<td>A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.</td>
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<td>B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply moderately effective organizational and presentational skills.</td>
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<td>C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.</td>
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<td>D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.</td>
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<td>Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.</td>
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<tr>
<td>Course Type</td>
<td>Lecture-based course</td>
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<tr>
<td>Course Teaching &amp; Learning Activities</td>
<td>Activities Details No. of Hours</td>
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<tr>
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<td>Lectures 36</td>
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<td></td>
<td>Tutorials 12</td>
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<td></td>
<td>Reading / self study 100</td>
</tr>
<tr>
<td>Assessment Methods and Weighting</td>
<td>Methods Details Weighting in final course grade (%) Assessment Methods to CLO Mapping</td>
</tr>
<tr>
<td></td>
<td>Assignments Coursework (assignments, tutorials, and a class test) 25 CLO 1,2,3</td>
</tr>
<tr>
<td></td>
<td>Examination One 3-hour written examination 75 CLO 1,2,3</td>
</tr>
<tr>
<td>Required/recommended reading and online materials</td>
<td>S. M. Ross: Introduction to Probability Models (9th edition)</td>
</tr>
<tr>
<td>Course Website</td>
<td>moodle.hku.hk</td>
</tr>
</tbody>
</table>

STAT3904: Corporate finance for actuarial science (6 credits)

<table>
<thead>
<tr>
<th>Course Co-ordinator</th>
<th>Dr D Lee, Statistics &amp; Actuarial Science (<a href="mailto:leedav@hku.hk">leedav@hku.hk</a>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers Involved</td>
<td>(Dr D Lee, Statistics &amp; Actuarial Science)</td>
</tr>
<tr>
<td>Course Objectives</td>
<td>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.</td>
</tr>
<tr>
<td>Course Contents &amp; Topics</td>
<td>The first part of the course will give an introduction to corporate finance and provide an overview of some topics covered in STAT2902 and STAT3615. These include: financial markets and companies; present value and net present value, financial instruments and dividends derivatives market, no-arbitrage pricing theory, binomial model and Black-Scholes option pricing formula. The main part of the course will focus on some important topics of corporate finance including: capital structure and dividend policy, financial leverage and firm value, market efficiency, risk and return, investment decision using Markowitz mean variance analysis, CAPM, long term financing, measures and performance assessment of financial performance using various measures.</td>
</tr>
<tr>
<td>Course Learning Outcomes</td>
<td>On successful completion of this course, students should be able to: CLO 1 understand the factors to be considered by a company when deciding on its capital structure and dividend policy, and also the impact of financial leverage and long/short term financing policies on capital structure; CLO 2 calculate the value of bonds and stocks; CLO 3 assess financial performance using various measures; CLO 4 understand the mean-variance portfolio theory.</td>
</tr>
</tbody>
</table>
Introduction to financial derivatives (6 credits)

**Course Learning & Topics**

**Teachers Involved**

Dr K C Cheung, Statistics & Actuarial Science

**Offer in 2017 - 2018**

Y 2nd sem Offer in 2018 - 2019 : Y

**Examination**

May

**Grade Descriptors (A+ to F)**

- **A**: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.

- **B**: Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.

- **C**: Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.

- **D**: Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.

- **Fail**: Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

**Exam**

- **Examination One**: 3-hour written examination

**Assessment Methods and Weighting**

- **Assignments**: Coursework (assignments, tutorials, and a class test)

  **Weighting in final course grade (%):** 25

- **Examination**: One 3-hour written examination

  **Weighting in final course grade (%):** 75

**Course Type**

Lecture-based course

**Course Teaching & Learning Activities**

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<td>Tutorials</td>
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<td>Reading / Self study</td>
<td></td>
<td>100</td>
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**Course Website**

moodle.hku.hk

**STAT3905**

Introduction to financial derivatives (6 credits)

**Offering Department**

Statistics & Actuarial Science

**Course Co-ordinator**

Dr K C Cheung, Statistics & Actuarial Science (kccq@hku.hk)

**Teachers Involved**

Dr K C Cheung, Statistics & Actuarial Science

**Course Objectives**

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.

**Course Contents & Topics**

- Derivatives; short-selling; forward contracts; call options; put options; equity-linked CD; spreads and collars; hedging; financial forwards and futures; commodity swaps; interest rate swaps; put-call parity.

**Course Learning Outcomes**

On successful completion of this course, students should be able to:

- CLO 1: define and recognize the definitions of terms commonly used in derivatives markets
- CLO 2: evaluate the payoff and profit of basic derivative contracts, including forwards, futures, options, and swaps
- CLO 3: explain how derivative securities can be used as tools to manage financial risk

**Pre-requisites (and Co-requisites and Impermissible combinations)**

- Pass in STAT2902; and
- For BSc(Actuarial Science) students only.

**Offer in 2017 - 2018**

Y 1st sem Offer in 2018 - 2019 : Y

**Examination**

Dec

**Grade Descriptors (A+ to F)**

- **A**: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.

- **B**: Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.

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**Exam**

- **Examination One**: 3-hour written examination

**Assessment Methods and Weighting**

- **Assignments**: Coursework (assignments, tutorials, and a class test)

  **Weighting in final course grade (%):** 25

- **Examination**: One 3-hour written examination

  **Weighting in final course grade (%):** 75

**Required/recommended reading and online materials**

Risk theory I (6 credits)

Offering Department: Statistics & Actuarial Science
Course Co-ordinator: Dr K C Cheung, Statistics & Actuarial Science (kccg@hku.hk)

Course Objectives
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.

Course Contents & Topics
Severity models; frequency models; collective risk models; coverage modifications; risk measures; simulation.

Course Learning Outcomes
On successful completion of this course, students should be able to:

CLO 1 understand the individual risk model and the collective risk model, evaluate the distribution and expectation of the total claim amounts
CLO 2 estimate the premium of a policyholder and the total claim amounts using the information of the claim amounts made in previous years
CLO 3 calculate some commonly used risk measures and explain their use and limitation
CLO 4 apply simulation methods within the context of actuarial models

Pre-requisites (and Co-requisites and Impermissible combinations)
Pass in STAT3903, or already enrolled in this course; or Pass in MATH3603 or STAT3603

Offer in 2017 - 2018
Y 2nd sem Offer in 2018 - 2019 : Y Examination May

Grade Descriptors
A: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.
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Fail: Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

Required/recommended reading and online materials

Course Website: moodle.hku.hk

Linear models and forecasting (6 credits)

Offering Department: Statistics & Actuarial Science
Course Co-ordinator: Dr G Li, Statistics & Actuarial Science (gdl@hku.hk)

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

Course Contents & Topics
Regression and multiple linear regression; predicting; generalised linear model; time series models including stochastic processes to insurance problems such as the premium calculation.

Course Learning Outcomes
On successful completion of this course, students should be able to:

CLO 1 fit a simple or multiple linear regression model to real data
CLO 2 do ANOVA analysis
CLO 3 fit a generalized linear model to the real data
CLO 4 identify and fit a suitable AR, MA or ARMA model to real data
CLO 5 perform residual analysis
CLO 6 Do forecasting with these fitted models

Pre-requisites (and Co-requisites and Impermissible combinations)
Pass in STAT2602 or STAT3902, or 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 ECN2280, or have already enrolled in this course; and For BSc(Actuarial Science) students only.

Offer in 2017 - 2018
Y 2nd sem Offer in 2018 - 2019 : Y Examination May

Grade Descriptors
A: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.
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C: Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.

Assignments Coursework (assignments, tutorials, and a class test) 25 CLO 1,2,3,4
Examination One 3-hour written examination 75 CLO 1,2,3,4

No. of Hours
Lectures: 36
Tutorials: 12
Reading / Self study: 100
Credibility theory and loss distributions (6 credits)

Dr A G Benchimol, Statistics & Actuarial Science

Offering Department
Statistics & Actuarial Science

Course Co-ordinator
Dr A G Benchimol, Statistics & Actuarial Science (ug_enquiry@saas.hku.hk)

Teachers Involved
(Dr A G Benchimol, Statistics & Actuarial Science)

Course Objectives
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.

Course Contents & Topics
Limited fluctuation approach; Buhlman’s approach; Bayesian approach; empirical Bayes parameter estimations; construction and selection of parametric models; properties and estimation of failure time and loss distributions, determination of the acceptability of a fitted model; comparison of fitted models; simulation of both discrete and continuous random variables.

Course Learning Outcomes
On successful completion of this course, students should be able to:

- CLO 1 apply limited fluctuation (classical) credibility including criteria for both full and partial credibility
- CLO 2 perform Bayesian analysis using both discrete and continuous models
- CLO 3 apply Buhlmann and Buhlmann-Straub models and understand the relationship of these to the Bayesian model
- CLO 4 apply conjugate priors in Bayesian analysis and in particular the Poisson-gamma model
- CLO 5 apply empirical Bayesian methods in the nonparametric and semiparametric cases
- CLO 6 construct and select empirical models
- CLO 7 determine the acceptability of a fitted model and/or compare models

Pre-requisites (and Co-requisites and Impermissible combinations)
Pass in STAT2602 or STAT3902 or STAT3906

Offer in 2017 - 2018
Y 1st sem

Grade Descriptors (A+ to F)
A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.

B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.

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D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

Assessment Methods and Weighting

<table>
<thead>
<tr>
<th>Methods</th>
<th>Details</th>
<th>Weighting in final course grade (%)</th>
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<tbody>
<tr>
<td>Assignments</td>
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<td>25</td>
<td>CLO 1,2,3,4,5,6,7</td>
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<td>Examination</td>
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Required/recommended reading and online materials

Course Website
moodle.hku.hk
<table>
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<tbody>
<tr>
<td>STAT3909</td>
<td>Advanced life contingencies</td>
<td>6</td>
<td>2017</td>
</tr>
<tr>
<td>STAT3910</td>
<td>Financial economics I</td>
<td>6</td>
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<tr>
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<tr>
<td>Dr D Lee, Statistics &amp; Actuarial Science</td>
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<th>Course Objectives</th>
<th>Pre-requisites</th>
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<tbody>
<tr>
<td>The objective of the course is to prepare students for the Non-traditional Life Insurance parts of the Models for Life Contingencies (MfLc) course of the Society of Actuaries. Emphasis will be placed on applications of more advanced theories of life contingencies.</td>
<td>Pass in STAT3901, or already enrolled in this course; and For BSc(Actuarial Science) students only.</td>
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<tbody>
<tr>
<td>This course is a continuation of the materials covered in STAT3901. We shall discuss the following topics: Future loss random variable, Benefit reserves, Cash flow projection, Present value of cash flows, Expenses and asset shares.</td>
<td>On successful completion of this course, students should be able to:</td>
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<td>CLO 1 calculate benefit reserves for life insurances and annuities</td>
<td>CLO 2 incorporate expenses in gross premium and calculate policy value based on the gross premium for life insurances and annuities</td>
</tr>
<tr>
<td>CLO 3 understand multiple decrement models and calculate the life insurances and annuities in models with multi decrements</td>
<td>CLO 4 understand the multiple state model and the Kolmogorov forward equations</td>
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<td>CLO 5 understand multiple life models and calculate the life insurances and annuities in multi-life models</td>
<td>CLO 6 understand the interest risk and calculate the life insurances and annuities when the interest rate is not a constant, and understand profit testing</td>
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<td>Tutorials</td>
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<td>This course is a basic course on the derivative market. The course covers discrete-time models, volatility estimation, and Black-Scholes formula and its variations. The course also includes some basic risk management ideas and methods. This course and STAT3911 will cover all the concepts, principles and techniques needed for SoA Exam MFE.</td>
<td>Option market; European and American options; conditional expectation and discrete-time martingale, discrete-time option-pricing theory; binomial model and its Greeks; true probabilities vs. risk-neutral probabilities; estimating volatility; the Black-Scholes formula; implied volatility; Greeks again; market-making and hedging, exotic options.</td>
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<td>On successful completion of this course, students should be able to:</td>
<td>CLO 1 calculate option price using binomial tree</td>
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<td>CLO 2 understand the risk neutral probability</td>
<td>CLO 3 understand basic probability theory, include probability space, random variable, conditional probability, conditional expectation and discrete time martingale</td>
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<td>CLO 4 understand the Black-Scholes formula and its assumptions, the option Greeks, option elasticity, and implied volatility</td>
<td>CLO 5 understand the hedging strategies and portfolio, market-maker risk, self-financing portfolio</td>
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<td>CLO 6 understand exotic options</td>
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Financial economics II (6 credits)  
Prof H L Yang, Statistics & Actuarial Science

Offer in 2017 - 2018: Y  
Offer in 2018 - 2019: Y

Grade Descriptors (A+ to F)

A  Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.

B  Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.

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Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

Course Type  Lecture-based course

Course Teaching & Learning Activities

- Activities: Details  No. of Hours
  - Lectures: 36
  - Tutorials: 12
  - Reading / Self study: 100

Assessment Methods and Weighting

- Methods: Details  Weighting in final course grade (%)  Assessment Methods to CLO Mapping
  - Assignments: Coursework (assignments, tutorials, and a class test) 25  CLO 1,3,4,5,6
  - Examination: One 3-hour written examination 75  CLO 1,3,4,5,6

Required/recommended reading and online materials

Robert L. McDonald: Derivatives Markets (2nd edition), Chapters 10-14

Course Website  moodle.hku.hk

STAT3911

Financial economics II (6 credits)  
Academic Year 2017

Offering Department  Statistics & Actuarial Science

Course Co-ordinator  Prof H L Yang, Statistics & Actuarial Science (hlyang@hku.hk)

Teachers Involved  (Prof H L Yang,Statistics & Actuarial Science)

Course Objectives

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 STAT3910 will cover all the concepts, principles and techniques needed for SOA Exam MFE.

Course Contents & Topics

Brownian motion; introduction to stochastic calculus; arithmetic and geometric Brownian motion; Ito formula; Sharpe ratio and risk premium; Black-Scholes equation; risk-neutral stock-price process and option pricing; option's elasticity and volatility; Vasicek, Cox-Ingersoll-Ross, and Black-Derman-Toy models; delta-hedging for bonds and the Sharpe-ratio equality constraint; Black's model; options on zero-coupon bonds; interest-rate caps and caplets.

Course Learning Outcomes

On successful completion of this course, students should be able to:

- CLO 1 understand Brownian motion and its properties
- CLO 2 understand the Ito calculus and Ito formula
- CLO 3 understand the Black-Scholes model and option pricing theory
- CLO 4 understand the delta hedging and some basic risk management methods
- CLO 5 understand some basic interest rate models

Pre-requisites (and Co-requisites and Impermissible combinations)

Pass in MATH3603 or STAT3603 or STAT3903 or STAT3910

Offer in 2017 - 2018: Y  
Offer in 2018 - 2019: Y

Grade Descriptors (A+ to F)

A  Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.

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Course Type  Lecture-based course

Course Teaching & Learning Activities

- Activities: Details  No. of Hours
  - Lectures: 36
  - Tutorials: 12
  - Reading / Self study: 100

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Required/recommended reading and online materials


Course Website  moodle.hku.hk
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<td>STAT3951</td>
<td>Advanced contingencies</td>
<td>6</td>
<td>Students should be able to:</td>
<td>This course covers more advanced stochastic models and actuarial techniques used in the field of life and non-life insurance.</td>
<td>moodle.hku.hk</td>
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<tr>
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<td>CLO 1 understand how to use multiple state models to evaluate expected cash flows dependent upon state transitions</td>
<td>Topic covers further analysis of the multiple state model; unit-linked contracts; cost of guarantees and options; applications of actuarial techniques to a wide range of insurance problems. Equity linked insurance products and valuation of these products. Simple dividend-ruin models for non-life insurance portfolio.</td>
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<td>CLO 2 understand the equity linked insurance products, and the method and idea of valuing the equity linked insurance products</td>
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<td>CLO 3 understand the Esscher transform and its application to option pricing</td>
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<td>CLO 4 value equity-linked death benefits</td>
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<td>CLO 5 evaluate ruin probabilities in simple risk processes for non-life insurance</td>
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<td>CLO 6 evaluate expected discounted dividends in simple risk processes with dividends</td>
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<td>Lecture notes on equity linked insurance products and simple dividend-ruin models.</td>
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<td>CT5 Contingencies of the Institute and Faculty of Actuaries, U.K.]</td>
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<td>This course covers more advanced stochastic models and actuarial techniques used in the field of life and non-life insurance.</td>
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</table>

Course Course Website: moodle.hku.hk

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Learning Outcomes</th>
<th>Course Contents</th>
<th>Course Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAT3952</td>
<td>Investment and asset management</td>
<td>6</td>
<td>Students should be able to:</td>
<td>This course provides an overview on the problems faced by actuaries when applying fundamental actuarial concepts to investment practice. This course will cover the following topics: Investment Management Process, Asset Allocation, Managing Fixed Income Portfolios and Performance Measurement.</td>
<td>moodle.hku.hk</td>
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<tr>
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<td>CLO 1 explain how an investment policy and an investment strategy can help manage risk</td>
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<td>CLO 2 identify the obligations of a fiduciary in managing investment portfolios</td>
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<td>CLO 3 describe how to select an investment strategy for an individual and the particular issues influencing investment strategies for institutional investors</td>
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<td>CLO 4 explain principles of risk-based capital management</td>
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<td>CLO 5 describe asset allocation strategies that can be used to construct an asset portfolio</td>
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<td>CLO 6 identify and describe financial and non-financial risks faced by an entity</td>
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<td>CLO 7 define risk metrics to quantify major types of risk exposure, apply ALM principles to the establishment of investment policy and strategy</td>
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</tbody>
</table>
CLO 6 select or build a benchmark for a given portfolio or portfolio management style, describe and assess performance measurement methodologies for investment portfolios

Pre-requisites (and Co-requisites and Impermissible combinations)
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.

Offer in 2017 - 2018
N Offer in 2018 - 2019 : N

Grade Descriptors (A+ to F)
A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.
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C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.
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Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

Course Type
Lecture-based course

Course Teaching & Learning Activities
Activities Details No. of Hours
Lectures 36
Tutorials 12
Reading / Self study 100

Assessment Methods and Weighting
Methods Details Weighting in final course grade (%) Assessment Methods to CLO Mapping
Assignments, tutorials/example classes, group discussions, project and presentation 50 CLO 1,2,3,4,5,6,7,8
Examination One 2-hour written examination 50 CLO 1,2,3,4,5,6,7,8

Required/recommended reading and online materials
Crouhy, Galai, & Mark: Risk Management (2001)

Course Website
moodle.hku.hk

Additional Course Information

STAT3953
Fundamentals of actuarial practice (6 credits)
Academic Year 2017

Offering Department
Statistics & Actuarial Science

Course Co-ordinator
Mr P P Y Lau, Statistics & Actuarial Science (ug_enquiry@saas.hku.hk)

Teachers Involved
Mr P P Y Lau, Statistics & Actuarial Science

Course Objectives
This course teaches students about the business environment and exposes them to practical real-world situations using the actuarial control cycle as a framework.

Course Contents & Topics
This course provides an overview on selected materials relating to the following topics: Role of the Professional Actuary, External Forces, Risk in Actuarial Problems, Design and Pricing of Actuarial Solutions. Emphasis will be placed on applications to various financial security programmes including individual life insurance, group insurance, social security plans, retirement plans, investment funds and property & casualty insurance.

Course Learning Outcomes
On successful completion of this course, students should be able to:
CLO 1 provide introductory description of financial security systems, common actuarial techniques and practical experiences
CLO 2 describe actuarial practices, principles, approaches, methods, commonalities, problems and solutions
CLO 3 explain actuarial practices across the traditional areas of practice
CLO 4 explain actuarial practices as applied directly on behalf of financial security system providers or as a consultant to those providers
CLO 5 apply actuarial skills in nontraditional and emerging areas of practice
CLO 6 provide context for the specific mathematical and technical skills developed in the basic actuarial courses
CLO 7 prepare for the professional role as an Associate of the Society of Actuaries

Pre-requisites (and Co-requisites and Impermissible combinations)
Pass in STAT3909; and For BSc(Actuarial Science) students only.

Offer in 2017 - 2018
Y 1st sem Offer in 2018 - 2019 : Y

Grade Descriptors (A+ to F)
A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.
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Department of Statistics & Actuarial Science

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This course aims at providing practical elements for actuarial students including daily life actuarial practice and the basic capability to understand, research in and handle the laws as and when situations would arise, which will benefit students in their coming future career.

### Course Objectives

This course covers a full range of topics related to both areas including 1) Practical Actuarial Practice and 2) Actuaries’ Legal Thinking.

For Practical Actuarial Practice: It covers the major practical topics in both Life and Casualty areas. For Life Insurance, it covers the full picture of actuarial control cycle including Product Pricing, Valuation, Financial Reporting and Experience Analysis. For General Insurance, it covers the backbone areas including Product Pricing and Valuation.

For Actuaries’ Legal Thinking: This is the 7th year of the course and the full start of a new course structure echoing changes in the market for basic legal and general insurance skills for actuaries. Intellectually stimulating recent legal materials with heavy involvement of actuarial and other general insurance expertise would dominate the course, alongside with basic legal research skills and fundamental legal thinking. Sharing of experience from guests from the General Insurance Industry would also infiltrate the course.

### Assessment Methods and Weighting

<table>
<thead>
<tr>
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<th>No. of Hours</th>
<th>Weighting in final course grade (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation oral presentation</td>
<td>25</td>
<td>CLO 4,5,6</td>
</tr>
<tr>
<td>Project reports written report</td>
<td>50</td>
<td>CLO 4,5,6,7</td>
</tr>
<tr>
<td>Test in-class quizzes</td>
<td>25</td>
<td>CLO 1,2,3,4,5,6,7</td>
</tr>
</tbody>
</table>

### Required/recommended reading and online materials


### Course Website

moodle.hku.hk

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Course Teaching &amp; Learning Activities</td>
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<tr>
<td>Activities</td>
<td>Details</td>
</tr>
<tr>
<td>Lectures</td>
<td>36</td>
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<tr>
<td>Project work</td>
<td></td>
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<tr>
<td>Reading / Self study</td>
<td>12</td>
</tr>
<tr>
<td>Assessment Methods and Weighting</td>
<td></td>
</tr>
<tr>
<td>Methods</td>
<td>Details</td>
</tr>
<tr>
<td>Assignments Coursework (assignments, practical project &amp; class test(s))</td>
<td>100</td>
</tr>
<tr>
<td>Academic Year</td>
<td>2017</td>
</tr>
<tr>
<td>Course Co-ordinator</td>
<td>TBC, Statistics &amp; Actuarial Science</td>
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<tr>
<td>Offered to</td>
<td>Statistics &amp; Actuarial Science</td>
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<td>Quota</td>
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<td>Teacher Involved</td>
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### Course Learning Outcomes

On successful completion of this course, students should be able to:

- CLO 1 have a basic understanding regarding Actuarial Control Cycle from A to Z for Life Insurance and General Insurance
- CLO 2 possess some experience regarding fundamental actuarial practice through practical project
- CLO 3 possess basic understanding of the legal system in Hong Kong
- CLO 4 possess fundamental knowledge in certain core legal aspects such as the law of contract and the law of tort
- CLO 5 possess fundamental knowledge of the law of insurance
- CLO 6 conduct elementary legal researches when facing with legal problems
- CLO 7 understand the basic elements of a routine judgment, the matrix of the facts and the law involved

### Pre-requisites (and Co-requisites and Impemissible combinations)

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

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<tr>
<th>Offer in 2017 - 2018</th>
<th>N</th>
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<tbody>
<tr>
<td>Offer in 2018 - 2019</td>
<td>N</td>
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<tr>
<td>Examination</td>
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### Teachers Involved

- Klugman, S.: Understanding Actuarial Practice (Society of Actuaries, 2012)
Survival analysis (6 credits)  

2017

(A) Pension funds and pension mathematics (6 credits)

2017 May

Course Contents & Topics

The nature and properties of parametric and nonparametric survival models will be studied. Topics to be covered include: the introduction of some important basic quantities like the hazard function and survival function; some commonly used parametric survival models; concepts of censoring and/or truncation; parametric estimation of the survival distribution by maximum likelihood estimation method; nonparametric estimation of the survival functions from possibly censored samples by means of the Kaplan-Meier estimator, the Nelson-Aalen estimator; and the kernel density estimator or the Ramlau-Hansen estimator and comparisons of k independent survival functions by means of the generalized log-rank test; parametric regression models; Cox's semiparametric proportional hazards regression model; and multivariate survival analysis.

Course Objectives

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.

Course Learning Outcomes

On successful completion of this course, students should be able to:

- CLO 1 acquire a clear understanding of the nature of failure time data or survival data, a generalization of the concept of death and life
- CLO 2 perform estimation for some commonly used survival models under different types of censoring mechanisms
- CLO 3 analyze survival data using the Cox's semiparametric proportional hazards model
- CLO 4 extend the Cox's model to a multivariate setup to accommodate multivariate survival data

Pre-requisites

Pass in STAT3902, or already enrolled in this course; or Pass in STAT3600 or STAT3901

Offer in 2017 - 2018

Y 2nd sem Offer in 2018 - 2019: Y

Grade Descriptors

(A to F)

<table>
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Methods

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<th>Assessment Methods to CLO Mapping</th>
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<tr>
<td>Assignments</td>
<td>Coursework (assignments, tutorials, and a class test)</td>
<td>25</td>
<td>CLO 1,2,3,4</td>
</tr>
<tr>
<td>Examination</td>
<td>One 3-hour written examination</td>
<td>75</td>
<td>CLO 1,2,3,4</td>
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</table>

Required/recommended reading and online materials


Course Website

moodle.hku.hk

Pension funds and pension mathematics (6 credits)  

2017

(A) Pension funds and pension mathematics (6 credits)

2017 May

Course Contents & Topics

This course covers the basics of pension plan design and pension fund management, as well as the fundamentals of pension plan valuations using different actuarial cost methods. The students will be introduced to the application of actuarial valuation techniques to the funding and accounting of pension plans.

Course Objectives

This course covers the basics of pension plan design and pension fund management, as well as the fundamentals of pension plan valuations using different actuarial cost methods. The students will be introduced to the application of actuarial valuation techniques to the funding and accounting of pension plans.

Course Learning Outcomes

On successful completion of this course, students should be able to:

- CLO 1 calculate the pension benefits in accordance with the provisions of a pension plan
- CLO 2 calculate the normal cost and actuarial liabilities using different actuarial cost methods
- CLO 3 perform gain and loss analyses for pension valuations
- CLO 4 select appropriate assumptions and methods for funding or accounting purposes
- CLO 5 interpret the valuation results presented in actuarial valuation reports
- CLO 6 understand the principles of asset and liability modeling as related to pension plans

Pre-requisites

Pass in STAT3909; and For BSc(Actuarial Science) students only.

Course Website

moodle.hku.hk

Department of Statistics & Actuarial Science
### Course: STAT4602 - Multivariate data analysis (6 credits)

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<tr>
<td>Examination</td>
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#### Course Type
- Lecture-based course

#### Course Teaching & Learning Activities
- **Activities**: Lectures, Tutorials, Reading / Self study
- **Details**: 36, 12
- **No. of Hours**: 36, 12

#### Assessment Methods and Weighting
- **Methods**: Assignments, Examination
- **Details**: Coursework (assignments, tutorials, and a class test), One 3-hour written examination
- **Weighting in final course grade (%)**: 25, 75
- **Assessment Methods to CLO Mapping**: CLO 1,2,3,4,5,6, CLO 1,2,3,4,5,6

#### Required/recommended reading and online materials
- **William H. Altkin**: Problem-Solving Approach to Pension Funding and Valuation, (2nd edition).
- **Actuarial Standard of Practice No. 27, Selection of Economic Assumptions for Measuring Pension Obligations**
- **Actuarial Standard of Practice No. 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations**
- **Actuarial Standard of Practice No. 44, Selection and Use of Asset Valuation Methods for Pension Valuations**
- **2001 Supplement to Actuarial Cost Methods-A Review, ACTEX Publications**

#### Course Website
- [http://moodle.hku.hk](http://moodle.hku.hk)

#### Grade Descriptors (A+ to F)
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#### Course Website
- [http://moodle.hku.hk](http://moodle.hku.hk)

#### Grade Descriptors (A+ to F)
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Credit risk analysis (6 credits)

Course Objectives:
- 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.

Course Contents & Topics:
- Probabilities of default, recovery rates and loss given default; Default and credit migration; credit scoring and methodology used in the financial industry and the regulatory framework in which the credit risk models operate.

Assessment Methods and Weighting:
- Methods: Coursework (assignments, tutorials, and a class test)
- Weighting in final course grade (%): 50
- Assessment Methods to CLO Mapping: CLO 1, 2, 3, 4, 5

Required/recommended reading and online materials:
- Srivastava, M. S.: Methods of Multivariate Statistics (John Wiley and Sons, 2002)
- SAS Manuals on-line: Use the HELP button.
Course Website: moodle.hku.hk

### STAT4608: Market risk analysis (6 credits)

**Offering Department:** Statistics & Actuarial Science  
**Academic Year:** 2017

<table>
<thead>
<tr>
<th>Course Co-ordinator</th>
<th>Dr Z Zhang, Statistics &amp; Actuarial Science (<a href="mailto:zhangz08@hku.hk">zhangz08@hku.hk</a>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers Involved</td>
<td>(Dr Z Zhang, Statistics &amp; Actuarial Science)</td>
</tr>
<tr>
<td>Course Objectives</td>
<td>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.</td>
</tr>
<tr>
<td>Course Contents &amp; Topics</td>
<td>Risk Measures; Value-at-Risk (VaR) models (parametric, Monte Carlo simulation and Historical time simulation); Risk factor mapping; Advanced VaR models (GARCH-type models, extreme-value theory and normal-mixture); Principal Component Analysis and VaR; Backtesting and stress testing.</td>
</tr>
</tbody>
</table>
| Course Learning Outcomes | On successful completion of this course, students should be able to:  
  - CLO 1: understand VaR and expected shortfall as risk measures  
  - CLO 2: compute VaR and expected shortfall  
  - CLO 3: model volatility using GARCH-type models  
  - CLO 4: understand extreme-value theory  
  - CLO 5: understand backtesting and stress testing. |

Pre-requisites (and Co-requisites and impermissible combinations):  
- Pass in STAT3907 and STAT3910;  
- Pass in STAT4601 and (FINA2320 or STAT3609)

<table>
<thead>
<tr>
<th>Grade Descriptors (A to F)</th>
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<tbody>
<tr>
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<td>Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.</td>
</tr>
<tr>
<td>B</td>
<td>Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.</td>
</tr>
<tr>
<td>C</td>
<td>Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.</td>
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<tr>
<td>D</td>
<td>Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.</td>
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<tr>
<td>Fail</td>
<td>Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.</td>
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<table>
<thead>
<tr>
<th>Course Type</th>
<th>Lecture-based course</th>
</tr>
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<tbody>
<tr>
<td>Course Teaching &amp; Learning Activities</td>
<td>Activities</td>
</tr>
<tr>
<td>Lectures</td>
<td>36</td>
</tr>
<tr>
<td>Tutorials</td>
<td>12</td>
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<td>Reading / Self study</td>
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</tr>
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<table>
<thead>
<tr>
<th>Assessment Methods and Weighting</th>
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<th>Details</th>
<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mappings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Coursework (assignments, tutorials, and a class test)</td>
<td>40</td>
<td>CLO 1, 2, 3, 4, 5</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>One 2-hour written examination</td>
<td>60</td>
<td>CLO 1, 2, 3, 4, 5</td>
<td></td>
</tr>
</tbody>
</table>


| Course Website | moodle.hku.hk |

### STAT4711: Capstone experience for actuarial science undergraduates (6 credits)

**Offering Department:** Statistics & Actuarial Science  
**Academic Year:** 2017

<table>
<thead>
<tr>
<th>Course Co-ordinator</th>
<th>Prof G Yin, Statistics &amp; Actuarial Science (<a href="mailto:ug_enquiry@saas.hku.hk">ug_enquiry@saas.hku.hk</a>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers Involved</td>
<td>(Prof G Yin, Statistics &amp; Actuarial Science)</td>
</tr>
<tr>
<td>Course Objectives</td>
<td>This project-based course aims to provide students with capstone experience to formulate and investigate practical problems in actuarial science by integrating and applying actuarial theories and techniques learnt in their university years. It aims to help the students to establish a good and solid foundation of self-learning skills, and to enable students to equip with hands-on experience in solving practical problems including definition of the problem, designing the solution, and presentation of the results.</td>
</tr>
</tbody>
</table>

| Course Contents & Topics | No formal teaching will be given for this course. Students are expected to devote 120-140 hours working on this project. Students will work in groups of four or five under the supervision of a teacher and/or an industry supervisor. Students are required to give a presentation on their work two to three weeks before the end of the semester, and submit their final report at the end of the semester. |

Topics acceptable for projects in this course can be related to any of the traditional actuarial areas of practice such as life insurance, pension, finance, investment, enterprise risk management and general insurance. Students are also encouraged to suggest topics in non-traditional actuarial areas provided they can find a suitable teacher and/or industry supervisor. All topics for this course will be subject to final approval by the Department to ensure
relevance to actuarial science.

Students will need to decide on the topic for a practical project, conduct market research regarding industry activities related to the topic, and make suggestion on a solution of the problem identified in their project.

### Course Learning Outcomes

On successful completion of this course, students should be able to:

- **CLO 1** define a practical problem, discuss the issues faced by different stakeholders, and design workable solutions for the problems

- **CLO 2** integrate theoretical results and practical approaches, and to specify limitations of current developments

- **CLO 3** work in a team and to collaborate with members with different background

- **CLO 4** deliver actuarial results effectively in a written report and in oral presentations

- **CLO 5** develop further logical, critical thinking, creativity, technical report writing, communication and consultation skills

- **CLO 6** explain to a non-actuarial audience the approaches of actuarial science as applied to problems in a financial security system

### Pre-requisites (and Co-requisites and Impermissible combinations)

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.

### Grade Descriptors (A+ to F)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.</td>
</tr>
<tr>
<td>B</td>
<td>Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.</td>
</tr>
<tr>
<td>C</td>
<td>Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show some evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to similar familiar situations. Apply moderate effectively organizational and presentational skills.</td>
</tr>
<tr>
<td>D</td>
<td>Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show some evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to less familiar situations. Apply limited organizational and presentational skills.</td>
</tr>
<tr>
<td>Fail</td>
<td>Show evidence of little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.</td>
</tr>
</tbody>
</table>

### Course Type

Project-based course

### Course Teaching & Learning Activities

<table>
<thead>
<tr>
<th>Activities</th>
<th>Details</th>
<th>No. of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading / Self study</td>
<td></td>
<td>120</td>
</tr>
</tbody>
</table>

### Assessment Methods and Weighting

<table>
<thead>
<tr>
<th>Methods</th>
<th>Details</th>
<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral presentation</td>
<td>oral presentation, progress, attendance and in-class discussion</td>
<td>50</td>
<td>CLO 1,2,3,4,5,6</td>
</tr>
<tr>
<td>Research report</td>
<td>written report</td>
<td>50</td>
<td>CLO 1,2,3,4,5</td>
</tr>
</tbody>
</table>

### Course Website

moodle.hku.hk

### STAT4767

Actuarial science internship (6 credits)

<table>
<thead>
<tr>
<th>Offering Department</th>
<th>Academic Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistics &amp; Actuarial Science</td>
<td>2017</td>
</tr>
</tbody>
</table>

### Course Co-ordinator

Dr A G Benchimol, Statistics & Actuarial Science (ug_enquiry@saas.hku.hk)

### Teachers Involved

(Various teachers as the assessors of oral presentations and written reports,Statistics & Actuarial Science)

### Course Objectives

This course is offered to actuarial science students who take on a 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.

This course will include a written report which 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 during his/her internship.

On successful completion of this course, students should be able to:

- **CLO 1** gain practical experiences during internship
- **CLO 2** describe basic actuarial practices learned during the internship
- **CLO 3** explain how actuarial theories learned in University can be applied in practice
- **CLO 4** provide context for specific technical skills developed in basic actuarial courses

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 1st sem 2nd sem Offer in 2018 - 2019 : Y Examination No Exam

Course Type

Internship

### Course Teaching & Learning Activities

<table>
<thead>
<tr>
<th>Activities</th>
<th>Details</th>
<th>No. of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internship work</td>
<td>it is expected that students are to work at least 6 months or 120 working days</td>
<td>960</td>
</tr>
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</table>

### Assessment Methods and Weighting

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</table>
The course is an advanced course in risk theory which extends various topics discussed in STAT3906. It discusses utility theory, ruin theory, aggregate claims process, and related topics.

The earliest that a student is allowed to take this capstone course is their year 3 study.

CLO 1: Formulate meaningful research problems
CLO 2: Learn and apply advanced techniques in probability and/or statistics to solve real-life problems
CLO 3: Understand utility theory including some commonly used utility functions, Jensen's inequality, risk aversion, and utility maximization
CLO 4: Define discrete and continuous ruin models
CLO 5: Understand non-homogeneous birth process and its applications as contagion models for claim frequencies

A minimum of 50% marks in each of CLO 1 to 5 is required to pass the course.

Grading:
- A: 80-100%
- B: 70-79%
- C: 60-69%
- D: 50-59%
- E: 40-49%
- F: 0-39%
- Fail: Below 40%

Oral presentation and in-class discussion takes up 60% of the final grade, and written report takes up 40% of the final grade.

Additional Course Information:
Approval is subject to past academic performance.
### Course Objectives

<table>
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<tr>
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<td>Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to some unseen problems. Apply moderately effective organizational and presentational skills.</td>
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<tr>
<td>Assignments</td>
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<td>25</td>
<td>CLO 1,2,3,4,5,6</td>
</tr>
<tr>
<td>Examination</td>
<td>One 3-hour written examination</td>
<td>75</td>
<td>CLO 1,2,3,4,5,6</td>
</tr>
</tbody>
</table>

### Required/recommended reading and online materials


### Course Type

- Lecture-based course

### Course Teaching & Learning Activities

<table>
<thead>
<tr>
<th>Activities</th>
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<td>Lectures</td>
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<td>36</td>
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<td>Tutorials</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Reading / Self study</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

### Course Website

moodle.hku.hk

### STAT4902

#### Selected topics in actuarial science (6 credits)

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Quota</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>---</td>
</tr>
</tbody>
</table>

#### Offering Department

- Statistics & Actuarial Science

#### Course Co-ordinator

- TBC, Statistics & Actuarial Science

#### Teachers Involved

- Markov chains and Markov models; Renewal theory; Distributions and ordering of risks; Ruin theory; Risk measurement; Central limit theorems; Use of simulation methods.

#### Course Objectives

This course is an advanced course in actuarial science which discusses selected topics which potential graduate students will find useful. It focuses on tools that are in the frontier of actuarial science with examples on applications.

#### Course Contents & Topics

The contents will be chosen from the following topics:
- Coherent risk measures; Premium calculation principles; Copulas; Extreme value theory; Stochastic dominance; Ordering of risks; Renewal equations with insurance applications; Reliability properties; Generalized linear models; Comonotonicity; Measures of dependency; Phase-type distributions; Applications to enterprise risk analysis; Other topics as determined by the instructor.

#### Course Learning Outcomes

On successful completion of this course, students should be able to:
- CLO 1 understand the mathematical tools useful for further research and applications
- CLO 2 apply the tools to solve potentially unseen problems
Actuarial techniques for general insurance (6 credits)

Offering Department: Statistics & Actuarial Science
Course Co-ordinator: Dr A G Benchimol, Statistics & Actuarial Science (ug_enquiry@saas.hku.hk)

Course Objectives

The purpose of this course is to develop knowledge of the basic techniques for ratemaking and estimating claim liabilities for general insurance. Application of the actuarial techniques to resolve general insurance problems will be emphasized. The course also provides general knowledge on the general insurance markets in Hong Kong and China. Students will acquire the fundamental concept on general insurance actuarial science together with the supporting calculations.

Course Contents & Topics

1. General Insurance Markets in Hong Kong, Taiwan and PRC
   - Introduction of general insurance markets
   - Regulations on general insurance

2. Basic techniques for ratemaking
   - How to read and use manual rate pages
   - Ratemaking related to exposures
   - Ratemaking related to premiums
   - Ratemaking related to loss and loss adjustment expenses
   - Calculate the underwriting expense provisions
   - Pure premium methods
   - Loss Ratio methods
   - Rating differential and relativities
   - Considerations when selecting the final rates

3. Estimating claim liabilities
   - Data requirement
   - Build and analyze claim development triangles
   - Reserving techniques
   - Considerations when estimating the claim liabilities
   - Estimate recoveries and unpaid claim adjustment expenses
   - Appraise and validation of the estimated results

4. Concurrent topics Applications using predictive modeling in General Insurance
   - e.g. predictive modeling, Enterprise Risk Management, etc

Course Learning Outcomes

On successful completion of this course, students should be able to:

- CLO 1 understand the feature and underlying risk of general insurance products
- CLO 2 calculate the premium rate for basic general insurance products
- CLO 3 estimate the claims liabilities for general insurance products

Pre-requisites (and Co-requisites and Impermissible combinations)

Pass in STAT3906

Offer in 2017 - 2018

Y 2nd sem Offer in 2018 - 2019 : Y Examination May

Grade Descriptors (A+ to F)

A  Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.

B  Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.

C  Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.

D  Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.

Fail  Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.

Course Type

Lecture-based course

Course Teaching & Learning Activities

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<td>CLO 1,2,3</td>
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<tr>
<td>Examination</td>
<td>One 3-hour written examination</td>
<td>75</td>
<td>CLO 2,3</td>
</tr>
</tbody>
</table>
Research methods in statistics (6 credits)

Course Objectives

On successful completion of this course, students should be able to:

1. Basic asymptotic methods: modes of convergence; stochastic orders; laws of large numbers; central limit theorems; delta method; Edgeworth expansions; saddlepoint approximations.
2. Parametric and nonparametric likelihood methods: high-order approximations; profile likelihood and its variants; signed likelihood ratio statistics; empirical likelihood.
3. Nonparametric statistical inference: sign and rank tests; Kolmogorov-Smirnov test; nonparametric regression; density estimation; kernel methods.
4. Computationally-intensive methods: cross-validation; bootstrap; permutation methods.
5. Robust methods: measures of robustness; M-estimator; L-estimator; R-estimator; estimating functions.
6. Sequential analysis: sequential probability ratio test; sequential estimation.
7. Model selection using information criteria.
8. Other topics as determined by the instructor.

Course Contents & Topics

Contents may be selected from:

- (1) Basic asymptotic methods: modes of convergence; stochastic orders; laws of large numbers; central limit theorems; delta method; Edgeworth expansions; saddlepoint approximations.
- (2) Parametric and nonparametric likelihood methods: high-order approximations; profile likelihood and its variants; signed likelihood ratio statistics; empirical likelihood.
- (3) Nonparametric statistical inference: sign and rank tests; Kolmogorov-Smirnov test; nonparametric regression; density estimation; kernel methods.
- (4) Computationally-intensive methods: cross-validation; bootstrap; permutation methods.
- (5) Robust methods: measures of robustness; M-estimator; L-estimator; R-estimator; estimating functions.
- (6) Sequential analysis: sequential probability ratio test; sequential estimation.
- (7) Model selection using information criteria.
- (8) Other topics as determined by the instructor.

Course Learning Outcomes

On successful completion of this course, students should be able to:

- CLO 1: Comprehend the language and technicalities found in statistical research literature.
- CLO 2: Understand the use of standard mathematical tools for conducting statistical research.
- CLO 3: Apply a variety of research tools to solve standard statistical problems.
- CLO 4: Acquire exposure to some developments in contemporary statistical research.

Pre-requisites (and Co-requisites and Impermissible combinations)

- Pass in STAT3600 or STAT3907.

Offer in 2017 - 2018

- Y 1st sem Offer in 2018 - 2019: Y

Assessment Methods & Weighting

- Examination: One 2-hour written examination
- Coursework: (assignments, tutorials, and a class test)

Course Site

moodle.hku.hk
Course Objectives

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

Course Contents & Topics

Contents include: sigma-algebra, measurable space, measure and probability, measure space and probability space, measurable functions, random variables, integration theory, characteristic functions, convergence of random variables, Hilbert spaces, conditional expectation, martingales.

Course Learning Outcomes

On successful completion of this course, students should be able to:

- CLO 1 understand the fundamental measure theory and probability theory
- CLO 2 learn the general concept of integration, understand the monotone convergence theorem, Fatou's lemma and dominated convergence theorem
- CLO 3 understand the concept of conditional expectation
- CLO 4 have some elementary knowledge of martingale

Pre-requisites (and Co-requisites and Impermissible combinations)

Pass in STAT3603 or STAT3903

Offer in 2017 - 2018

Y 1st sem Offer in 2018 - 2019 : Y

Course Website

Prof G Yin, Statistics & Actuarial Science (gyin@hku.hk)

Grade Descriptors (A+ to F)

A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.

B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.

C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.

D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.

Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffectual.

Course Type

Lecture-based course

Course Teaching & Learning Activities

<table>
<thead>
<tr>
<th>Activities</th>
<th>Details</th>
<th>No. of Hours</th>
</tr>
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<tbody>
<tr>
<td>Lectures</td>
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<td>36</td>
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<tr>
<td>Tutorials</td>
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<td>12</td>
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<tr>
<td>Reading / Self study</td>
<td></td>
<td>100</td>
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</table>

Assessment Methods and Weighting

<table>
<thead>
<tr>
<th>Methods</th>
<th>Details</th>
<th>Weighting in final course grade (%)</th>
<th>Assessment Methods to CLO Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>Coursework (assignments, tutorials, and a class test)</td>
<td>25</td>
<td>CLO 1,2,3,4</td>
</tr>
<tr>
<td>Examination</td>
<td>One 2-hour written examination</td>
<td>75</td>
<td>CLO 1,2,3,4</td>
</tr>
</tbody>
</table>

Required/recommended reading and online materials


Course Website

moodle.hku.hk

STAT7611
Computational statistics (6 credits)

Academic Year 2017

Offering Department
Statistics & Actuarial Science

Course Co-ordinator
Prof G Yin, Statistics & Actuarial Science (gyin@hku.hk)

Teachers Involved
(Prof G Yin, Statistics & Actuarial Science)

Course Objectives

This course aims to give undergraduate and postgraduate students in statistics a background in modern computationally-intensive methods in statistics. It emphasizes the role of computation as a fundamental tool of discovery in data analysis, of statistical inference, and for development of statistical theory and methods.

Course Contents & Topics

Contents include: Bayesian statistics, Markov chain Monte Carlo methods including Gibbs sampler, the Metropolis-Hastings algorithm, and data augmentation; Generation of random variables including the inversion method, rejection sampling, the sampling/importance resampling method; Optimization techniques including Newton’s method, expectation-maximization (EM) algorithm and its variants, and minorization-maximization (MM) algorithms; Integration including Laplace approximations, Gaussian quadrature, the importance sampling method; and other topics such as Hidden Markov models, neural networks, and Bootstrap methods.

Course Learning Outcomes

On successful completion of this course, students should be able to:

- CLO 1 understand the importance of the technique for generating random variables in Bayesian statistics, Monte Carlo integration and bootstrapping methods
- CLO 2 realize the advantages and disadvantages of the Newton-Raphson algorithm and the Fisher scoring algorithm and apply them to fit generalized linear models
- CLO 3 understand the essence and basic principle of the EM-type algorithms and MM-type algorithms, realize their range of application, and apply them to solve practical problems
- CLO 4 apply EM-type algorithms to find the posterior mode and apply Markov chain Monte Carlo methods to generate posterior samples
- CLO 5 apply Bootstrap methods to obtain estimated standard errors of estimators and confidence intervals of parameters for both parametric and non-parametric cases

Pre-requisites (and Co-requisites and Impermissible combinations)

Pass in STAT3600 or STAT3907

Offer in 2017 - 2018

Y 1st sem Offer in 2018 - 2019 : Y

Grade Descriptors (A+ to F)

A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.

B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.
Advanced quantitative risk management and finance (6 credits)

Offering Department
Statistics & Actuarial Science

Course Co-ordinator
Prof W K Li, Statistics & Actuarial Science (hrmtwk@hku.hk)

Teachers Involved
(Dr J Song,Mathematics)
(Prof W K Li,Statistics & Actuarial Science)

Course Objectives
This course covers statistical methods and models of importance to risk management and finance and links finance theory to market practice via statistical modeling and decision making. Emphases will be put on empirical analyses to address the discrepancy between finance theory and market data.

Course Contents & Topics
Contents include: Elementary Stochastic Calculus; Basic Monte Carlo and Quasi-Monte Carlo Methods; Variance Reduction Techniques; Simulating the values of options and the value-at-risk for risk management; Review of univariate volatility models; multivariate volatility models; Value-at-risk and expected shortfall; estimation, back-testing and stress testing; Extreme value theory for risk management.

Course Learning Outcomes
On successful completion of this course, students should be able to:

CLO 1 apply Monte Carlo methods to determine the value of options and other derivative securities
CLO 2 predict volatility of a set of securities using appropriate models
CLO 3 estimate the value-at-risk under extreme value theory

Pre-requisites
Pass in STAT4608

Course Website
moodle.hku.hk
SECTION VII  Degree Regulations

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

These regulations apply to students admitted under the 4-year ‘2012 curriculum’ to the BSc in 
Actuarial Science degree curriculum to the first year in the academic year 2017-18 and thereafter. 
(See also General Regulations and Regulations for First Degree Curricula)

Definitions

AS1 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 eight semesters of full-
time study, extending over not fewer than four 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 six academic years.

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

Curriculum requirements and progression in curriculum

AS5

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

(b) Candidates shall take not fewer than 240 credits, in the manner specified in these regulations and the syllabuses, including 138 credits of the required courses as prescribed in the professional core of 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 288 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 432 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 recommended for discontinuation of 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 (not including the summer semester), 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 before admission to the curriculum 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**

**AS7**

(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 passed 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.

(e) There shall be no appeal against the results of examinations and other forms of assessment.

---

**Award of BSc in Actuarial Science Degree**

**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 240 credits, comprising 138 credits of the required courses as prescribed in the professional core of the BSc(ActuarSc) degree curriculum.
Honours classification

AS9

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the Degree of BSc(ActuarSc) in accordance with the following Graduation GPA scores, with all courses taken (including failed courses, but not including courses approved by the Senate graded as ‘Pass’, ‘Fail’ or ‘Distinction’) carrying weightings which are proportionate to their credit values:

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<thead>
<tr>
<th>Class of honours</th>
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</tr>
<tr>
<td>Pass</td>
<td>1.00 – 1.69</td>
</tr>
</tbody>
</table>

(b) Honours classification may not be determined solely on the basis of a candidate’s Graduation GPA and the Board of Examiners for the Degree of BSc(ActuarSc) may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.

(c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

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2 For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core course with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.
Definitions

AS1 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 eight semesters of full-time study, extending over not fewer than four 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 six 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.

1 This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.
Curriculum requirements and progression in curriculum

AS5

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

(b) Candidates shall take not fewer than 240 credits, in the manner specified in these regulations and the syllabuses, including 138 credits of the required courses as prescribed in the professional core of 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 288 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 432 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 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 recommended for discontinuation of 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 (not including the summer semester), 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 before admission to the curriculum 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

AS7

(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 passed 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.

(e) There shall be no appeal against the results of examinations and other forms of assessment.

Award of BSc in Actuarial Science Degree

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 240 credits, comprising 138 credits of the required courses as prescribed in the professional core of the BSc(ActuarSc) degree curriculum.

Honours classification

AS9

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the Degree of BSc(ActuarSc) in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses, but not including courses approved by the Senate graded as ‘Pass’, ‘Fail’ or ‘Distinction’) carrying equal weighting:

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(b) Honours classification may not be determined solely on the basis of a candidate’s Cumulative GPA and the Board of Examiners for the Degree of BSc(ActuarSc) may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.

(c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.
REGULATIONS FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN ACTUARIAL SCIENCE  
BSc(ActuarSc)

These regulations apply to students admitted under the 4-year ‘2012 curriculum’ to the BSc in Actuarial Science degree curriculum to the first year in the academic years 2012-13 and 2013-14.  

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

Definitions

AS1 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 eight semesters of full-time study, extending over not fewer than four 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 six 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.

1 This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.
Curriculum requirements and progression in curriculum

AS5

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

(b) Candidates shall take not fewer than 240 credits, in the manner specified in these regulations and the syllabuses, including 138 credits of the required courses as prescribed in the professional core of 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 288 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 432 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 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 recommended for discontinuation of their studies if they have:

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(ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), 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

AS7

(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 passed 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.

(e) There shall be no appeal against the results of examinations and other forms of assessment.

Award of BSc in Actuarial Science Degree

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 240 credits, comprising 138 credits of the required courses as prescribed in the professional core of the BSc(ActuarSc) degree curriculum.

Honours classification

AS9

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the Degree of BSc(ActuarSc) in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses, but not including courses approved by the Senate graded as ‘Pass’, ‘Fail’ or ‘Distinction’) carrying equal weighting:

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(c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.
REGULATIONS FOR FIRST DEGREE CURRICULA

Regulations for First Degree Curricula (for students admitted under the 4-year ‘2012 curriculum’ to the first year in the academic year 2017-18 and thereafter)

(See also General Regulations)

UG 1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined —

An ‘academic year’ comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a ‘summer semester’ may be organized in addition to the normal two semesters. Clinical curricula have extended semesters.

A ‘summer semester’ normally comprises seven to eight weeks of intensive timetabled teaching and assessment to commence four weeks after the end of the second semester assessment period, and to conclude about one week before the start of the next academic year.

The ‘maximum period of registration’ is equivalent to a period which is 150% of the curriculum’s normative period of study as specified in the degree regulations, provided that where this results in a residual fraction of an academic year, the fractional period shall be extended to one full academic year.

‘Degree curriculum’ means the entire study requirements for the award of an undergraduate degree.

‘Major programme’ means the study requirements, including a capstone experience, for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 72 credits nor more than 96 credits, as prescribed in the syllabuses for a degree curriculum.

‘Minor programme’ means the study requirements for a single minor area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 36 credits nor more than 48 credits, as prescribed in the syllabuses for a degree curriculum.

‘Professional core’ refers to the study requirements, including a capstone experience, prescribed in the regulations and syllabuses for disciplinary studies in degree curricula which are not structured as major/minor programmes for reasons relating to professional qualification and/or accreditation.

‘Course’ means a course of study, with a credit value expressed as a number of credit-units.

1 These regulations are applicable to candidates admitted from 2016-17 onwards to the first year of first degree curricula under the 4-year ‘2012 curriculum’, the 2-year curriculum in respect of the BSc(IM), the 5-year curriculum in respect of the BA&BED(LangEd), BEd&BSc, BEd&BSoCSc, BSc(Sp&HearSc), and BNurs, and the 6-year curriculum in respect of the BChinMed, BDS and MBBS. Reference in these regulations to the powers of the Boards of Faculties shall be applicable to Senate Boards of Studies which administer first degree curricula.

(The Regulations for First Degree Curricula applicable to cohorts admitted in 2012-13 and 2013-14 under the 4-year ‘2012 curriculum’ can be found in the Calendar for 2013-14, and in the Calendar for 2014-15 for the cohorts admitted in 2014-15 and 2015-16.)
as specified in the syllabuses for a degree curriculum.

‘Disciplinary elective course’ or ‘Disciplinary Elective’ means any course offered in the same major or minor programme or the professional core which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabuses of the degree curriculum.

‘Elective course’ or ‘Elective’ means any course offered within the same or another curriculum, other than compulsory courses in the candidate’s degree curriculum, that can be taken by the candidate in order to complete the credit requirements of the degree curriculum.

‘Capstone experience’ refers to one or more courses within the major programme or professional core which are approved by the Board of the Faculty for the purpose of integrating knowledge and skills acquired, and which are prescribed in the syllabuses of the degree curriculum.

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

‘Prerequisite’ means a course or a group of courses which candidates must have completed successfully or a requirement which candidates must have fulfilled before being permitted to take the course in question.

‘Corequisite’ means a course which candidates must take in conjunction with the course in question.

‘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.

‘Grade Points’ are standardized measurements of candidates’ academic achievement in courses taken to satisfy the requirements of the degree curriculum and are expressed as a scale prescribed in these regulations.

‘Grade Point Average’ is a numerical measure of a candidate’s academic achievement over a specified period of time. Each course attempted (including each failed course) is assigned a numerical value, with all courses carrying equal weighting. This numerical value is the product of grade points earned for the course and the credit value of that course. The ‘Grade Point Average’ is the sum of these numerical values divided by the total number of credits attempted:

\[
GPA = \frac{\sum_i \text{Course Grade Point} \times \text{Course Credit Value}}{\sum_i \text{Course Credit Value}}
\]

(where ‘i’ stands for all passed and failed courses taken by the student over a specified period)

‘Semester Grade Point Average’ or ‘Semester GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) during a given semester.

‘Year Grade Point Average’ or ‘Year GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) during a given academic year.

‘Cumulative Grade Point Average’ or ‘Cumulative GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) at the time of calculation.

‘Graduation Grade Point Average’ or ‘Graduation GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) at the point of graduation. For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core courses with the highest grades (covering all four Areas of Inquiry), or all six
courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

‘Assessment’ refers to judgment about the quality and extent to which a student has achieved the stated learning objectives or learning outcomes. It includes all types of assessment activities which allow for such a judgment to be made. For the purpose of interpreting the relevant provisions of the Ordinance and the Statutes and where appropriate, reference to ‘examination’ or ‘examinations’ in the Ordinance and the Statutes shall include and cover all forms of ‘assessment’ and its related processes.

A ‘transcript’ refers to a transcript of the record of study of a candidate, issued by the Registry of the University.

UG 2 Advanced standing:

Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with the following principles:

(a) at least half the number of credits of the degree curriculum normally required for award of the degree shall be accumulated through study at this University or from transfer of credits for courses completed at other institutions in accordance with Regulation UG 4(d); and

(b) in accordance with Statute III.5 and notwithstanding the granting of advanced and/or transfer credits, a minimum of two semesters of study at this University shall be required before a candidate is considered for the award of a first degree, other than a degree in medicine or surgery, and a minimum of four semesters of study at this University shall be required before a candidate is considered for a first degree in medicine or surgery.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

UG 3 Period of study:

The period of study of the curriculum shall be specified in the regulations governing the degree. To be eligible for award of the degree, a candidate shall fulfill all curriculum requirements within the maximum period of registration, unless otherwise permitted or required by the Board of the Faculty.

UG 4 Progression in curriculum:

(a) 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 is fewer than 24 credits.

(b) 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 for the normative period of study specified in the curriculum regulations, save as provided for under UG4(c).
(c) 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 for the maximum period of registration specified in the curriculum regulations.

(d) 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 may be recorded in 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.

(e) Unless otherwise permitted by the Board of the Faculty, candidates shall be recommended for discontinuation of 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 (not including the summer semester), or

(iii) exceeded the maximum period of registration specified in the regulations of the degree.

UG 5 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to the requirements prescribed in the regulations and syllabuses governing the degree curriculum within the maximum period of registration:

(a) successful completion of 12 credits in English language enhancement, including 6 credits in Core University English\(^2\) and 6 credits in an English in the Discipline course\(^3\);

(b) successful completion of 6 credits in Chinese language enhancement\(^4\);

(c) successful completion of 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry\(^5\) with not more than 24 credits of course being selected within one academic year except where candidates are required to make up for failed credits; and

(d) successful completion of a capstone experience as specified in the syllabuses of the degree curriculum.

\(^2\) Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu, see Regulation UG6.

\(^3\) (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates’ home Faculty.

(b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates’ home Faculty.

(c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

\(^4\) Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take an elective course in lieu, see Regulation UG6.

\(^5\) Candidates registered for double degree studies are required to successfully complete 24 credits of courses in the Common Core Curriculum, selecting one course from each Area of Inquiry, within the curriculum of the first degree, as appropriate.
UG 6 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

UG 7 Assessment:

(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 passed 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 suspended under Statute XXXI shall not be allowed to take, present themselves for, and participate in any assessments during the period of suspension, unless otherwise permitted by the Senate.

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

(e) Candidates are required to make up for failed courses in the following manner as prescribed in the curriculum regulations:
   (i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
   (ii) re-submitting failed coursework, without having to repeat the same course of instruction; or
   (iii) repeating the failed course by undergoing instruction and satisfying the assessments; or
   (iv) for elective courses, taking another course in lieu and satisfying the assessment requirements.

(f) There shall be no appeal against the results of examinations and all other forms of assessment.
UG 8 Grading system:

(a) The grades, their standards and the grade points for assessment shall be as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>Excellent</td>
<td>4.3</td>
</tr>
<tr>
<td>A</td>
<td>Excellent</td>
<td>4.0</td>
</tr>
<tr>
<td>A-</td>
<td></td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td>Good</td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>3.0</td>
</tr>
<tr>
<td>B-</td>
<td></td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td>Satisfactory</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>Satisfactory</td>
<td>2.0</td>
</tr>
<tr>
<td>C-</td>
<td></td>
<td>1.7</td>
</tr>
<tr>
<td>D+</td>
<td>Pass</td>
<td>1.3</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>F</td>
<td>Fail</td>
<td>0</td>
</tr>
</tbody>
</table>

(b) Special permission may be given by Senate for courses in individual curricula to be graded as ‘Pass’, ‘Fail’ or ‘Distinction’. Such courses will not be included in the calculation of the GPA.

UG 9 Honours classifications:

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Graduate GPA scores, with all courses taken (including failed courses) carrying equal weighting which are proportionate to their credit values:

<table>
<thead>
<tr>
<th>Class of honours</th>
<th>GGPA range</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Class Honours</td>
<td>3.60 – 4.30</td>
</tr>
<tr>
<td>Second Class Honours</td>
<td>(2.40 – 3.59)</td>
</tr>
<tr>
<td>Division One</td>
<td>3.00 – 3.59</td>
</tr>
<tr>
<td>Division Two</td>
<td>2.40 – 2.99</td>
</tr>
<tr>
<td>Third Class Honours</td>
<td>1.70 – 2.39</td>
</tr>
<tr>
<td>Pass</td>
<td>1.00 – 1.69</td>
</tr>
</tbody>
</table>

(b) Honours classification may not be determined solely on the basis of a candidate’s Graduation GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.

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6 UG 8 is not applicable to the respective Professional Core of the BDS and MBBS curricula.
7 UG 9 is not applicable to the BChinMed, BDS and MBBS curricula.
8 For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core course with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.
(c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.
REGULATIONS FOR FIRST DEGREE CURRICULA ¹

Regulations for First Degree Curricula (for students admitted under the 4-year ‘2012 curriculum’ to the first year in the academic years in 2014-15, 2015-16 and 2016-17, and students admitted directed to the third year in the academic years 2016-17, 2017-18 and 2018-19)

(See also General Regulations)

UG 1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined —

An ‘academic year’ comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a ‘summer semester’ may be organized in addition to the normal two semesters. Clinical curricula have extended semesters.

A ‘summer semester’ normally comprises seven to eight weeks of intensive timetabled teaching and assessment to commence four weeks after the end of the second semester assessment period, and to conclude about one week before the start of the next academic year.

The ‘maximum period of registration’ is equivalent to a period which is 150% of the curriculum’s normative period of study as specified in the degree regulations, provided that where this results in a residual fraction of an academic year, the fractional period shall be extended to one full academic year.

‘Degree curriculum’ means the entire study requirements for the award of an undergraduate degree.

‘Major programme’ means the study requirements, including a capstone experience, for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 72 credits nor more than 96 credits, as prescribed in the syllabuses for a degree curriculum.

‘Minor programme’ means the study requirements for a single minor area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 36 credits nor more than 48 credits, as prescribed in the syllabuses for a degree curriculum.

‘Professional core’ refers to the study requirements, including a capstone experience, prescribed in the regulations and syllabuses for disciplinary studies in degree curricula which are not structured as major/minor programmes for reasons relating to professional qualification and/or accreditation.

¹ These regulations are applicable to candidates admitted from 2016-17 onwards to the first year of first degree curricula under the 4-year ‘2012 curriculum’, the 2-year curriculum in respect of the BSc(IM), the 5-year curriculum in respect of the BA&BED(LangEd), BED&BSc, BEd&BSc, BSc(Sp&HearSc), and BNurs, and the 6-year curriculum in respect of the BChinMed, BDS and MBBS. Reference in these regulations to the powers of the Boards of Faculties shall be applicable to Senate Boards of Studies which administer first degree curricula.

(The Regulations for First Degree Curricula applicable to cohorts admitted in 2012-13 and 2013-14 under the 4-year ‘2012 curriculum’ can be found in the Calendar for 2013-14, and in the Calendar for 2014-15 for the cohorts admitted in 2014-15 and 2015-16.)
‘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.

‘Disciplinary elective course’ or ‘Disciplinary Elective’ means any course offered in the same major or minor programme or the professional core which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabuses of the degree curriculum.

‘Elective course’ or ‘Elective’ means any course offered within the same or another curriculum, other than compulsory courses in the candidate’s degree curriculum, that can be taken by the candidate in order to complete the credit requirements of the degree curriculum.

‘Capstone experience’ refers to one or more courses within the major programme or professional core which are approved by the Board of the Faculty for the purpose of integrating knowledge and skills acquired, and which are prescribed in the syllabuses of the degree curriculum.

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

‘Prerequisite’ means a course or a group of courses which candidates must have completed successfully or a requirement which candidates must have fulfilled before being permitted to take the course in question.

‘Corequisite’ means a course which candidates must take in conjunction with the course in question.

‘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.

‘Grade Points’ are standardized measurements of candidates’ academic achievement in courses taken to satisfy the requirements of the degree curriculum and are expressed as a scale prescribed in these regulations.

‘Grade Point Average’ is a numerical measure of a candidate’s academic achievement over a specified period of time. Each course attempted (including each failed course) is assigned a numerical value, with all courses carrying equal weighting. This numerical value is the product of grade points earned for the course and the credit value of that course. The ‘Grade Point Average’ is the sum of these numerical values divided by the total number of credits attempted:

\[
GPA = \frac{\sum_{i} \text{Course Grade Point} \times \text{Course Credit Value}}{\sum_{i} \text{Course Credit Value}}
\]

(where ‘i’ stands for all passed and failed courses taken by the student over a specified period)

‘Semester Grade Point Average’ or ‘Semester GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) during a given semester.

‘Year Grade Point Average’ or ‘Year GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) during a given academic year.

‘Cumulative Grade Point Average’ or ‘Cumulative GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) at the time of calculation.

‘Assessment’ refers to judgment about the quality and extent to which a student has achieved the stated learning objectives or learning outcomes. It includes all types of assessment activities which allow for such a judgment to be made. For the purpose of interpreting the relevant provisions of the Ordinance and the Statutes and where appropriate,
reference to ‘examination’ or ‘examinations’ in the Ordinance and the Statutes shall include and cover all forms of ‘assessment’ and its related processes.

A ‘transcript’ refers to a transcript of the record of study of a candidate, issued by the Registry of the University.

UG 2 Advanced standing:

Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with the following principles:

(a) at least half the number of credits of the degree curriculum normally required for award of the degree shall be accumulated through study at this University or from transfer of credits for courses completed at other institutions in accordance with Regulation UG 4(d); and

(b) in accordance with Statute III.5 and notwithstanding the granting of advanced and/or transfer credits, a minimum of two semesters of study at this University shall be required before a candidate is considered for the award of a first degree, other than a degree in medicine or surgery, and a minimum of four semesters of study at this University shall be required before a candidate is considered for a first degree in medicine or surgery.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

UG 3 Period of study:

The period of study of the curriculum shall be specified in the regulations governing the degree. To be eligible for award of the degree, a candidate shall fulfill all curriculum requirements within the maximum period of registration, unless otherwise permitted or required by the Board of the Faculty.

UG 4 Progression in curriculum:

(a) 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 is fewer than 24 credits.

(b) 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 for the normative period of study specified in the curriculum regulations, save as provided for under UG4(c).

(c) 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 for the maximum period of registration specified in the curriculum regulations.

(d) 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 may be recorded in 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.

(e) Unless otherwise permitted by the Board of the Faculty, candidates shall be recommended for discontinuation of 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 (not including the summer semester), or

(iii) exceeded the maximum period of registration specified in the regulations of the degree.

UG 5 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to the requirements prescribed in the regulations and syllabuses governing the degree curriculum within the maximum period of registration:

(a) successful completion of 12 credits in English language enhancement, including 6 credits in Core University English² and 6 credits in an English in the Discipline course³;

(b) successful completion of 6 credits in Chinese language enhancement⁴;

(c) successful completion of 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁵ with not more than 24 credits of course being selected within one academic year except where candidates are required to make up for failed credits; and

(d) successful completion of a capstone experience as specified in the syllabuses of the degree curriculum.

UG 6 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the

² Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu, see Regulation UG6.

³ (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates’ home Faculty.

(b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates’ home Faculty.

(c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

⁴ Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take an elective course in lieu, see Regulation UG6.

⁵ Candidates registered for double degree studies are required to successfully complete 24 credits of courses in the Common Core Curriculum, selecting one course from each Area of Inquiry, within the curriculum of the first degree, as appropriate.
requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

**UG 7 Assessment:**

(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 passed 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 suspended under Statute XXXI shall not be allowed to take, present themselves for, and participate in any assessments during the period of suspension, unless otherwise permitted by the Senate.

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

(e) Candidates are required to make up for failed courses in the following manner as prescribed in the curriculum regulations:

   (i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or

   (ii) re-submitting failed coursework, without having to repeat the same course of instruction; or

   (iii) repeating the failed course by undergoing instruction and satisfying the assessments; or

   (iv) for elective courses, taking another course in lieu and satisfying the assessment requirements.

(f) There shall be no appeal against the results of examinations and all other forms of assessment.

**UG 8 Grading system:**

(a) The grades, their standards and the grade points for assessment shall be as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>Excellent</td>
<td>4.3</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>4.0</td>
</tr>
<tr>
<td>A-</td>
<td></td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td>Good</td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>3.0</td>
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<tr>
<td>B-</td>
<td></td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td>Satisfactory</td>
<td>2.3</td>
</tr>
<tr>
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<td>2.0</td>
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<tr>
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<td>1.0</td>
</tr>
<tr>
<td>F</td>
<td>Fail</td>
<td>0</td>
</tr>
</tbody>
</table>

6 UG 8 is not applicable to the respective Professional Core of the BDS and MBBS curricula.
(b) Special permission may be given by Senate for courses in individual curricula to be graded as ‘Pass’, ‘Fail’ or ‘Distinction’. Such courses will not be included in the calculation of the GPA.

**UG 9 Honours classifications:**

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses) carrying equal weighting:

<table>
<thead>
<tr>
<th>Class of honours</th>
<th>CGPA range</th>
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<tbody>
<tr>
<td>First Class Honours</td>
<td>3.60 – 4.30</td>
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<tr>
<td>Second Class Honours</td>
<td>(2.40 – 3.59)</td>
</tr>
<tr>
<td>Division One</td>
<td>3.00 – 3.59</td>
</tr>
<tr>
<td>Division Two</td>
<td>2.40 – 2.99</td>
</tr>
<tr>
<td>Third Class Honours</td>
<td>1.70 – 2.39</td>
</tr>
<tr>
<td>Pass</td>
<td>1.00 – 1.69</td>
</tr>
</tbody>
</table>

(b) Honours classification may not be determined solely on the basis of a candidate’s Cumulative GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.

(c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

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7 UG 9 is not applicable to the BChinMed, BDS and MBBS curricula.
REGULATIONS FOR FIRST DEGREE CURRICULA

Regulations for First Degree Curricula (for students admitted under the 4-year ‘2012 curriculum’ to
the first year in the academic years 2012-13 and 2013-14, and students admitted directly to the third
year in 2014-15 and 2015-16)

(See also General Regulations)

UG 1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise
defined —

An ‘academic year’ comprises two semesters, the first semester to commence in September
and end in December, and the second semester to commence in January and end in
May/June, on dates as prescribed by the Senate. It includes, normally at the end of each
semester, a period during which candidates are assessed. For some curricula, a ‘summer
semester’ may be organized in addition to the normal two semesters. Clinical curricula
have extended semesters.

A ‘summer semester’ normally comprises seven to eight weeks of intensive timetabled
teaching and assessment to commence four weeks after  the end of the second semester
assessment period, and to conclude about one week before the start of the next academic
year.

The ‘maximum period of registration’ is equivalent to a period which is 150% of the
curriculum’s normative period of study as specified in the degree regulations, provided that
where this results in a residual fraction of an academic year, the fractional period shall be
extended to one full academic year.

‘Degree curriculum’ means the entire study requirements for the award of an undergraduate
degree.

‘Major programme’ means the study requirements, including a capstone experience, for a
single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating
not fewer than 72 credits nor more than 96 credits, as prescribed in the syllabuses for a
degree curriculum.

‘Minor programme’ means the study requirements for a single minor area of disciplinary,
interdisciplinary or multidisciplinary study, accumulating not fewer than 36 credits nor more
than 48 credits, as prescribed in the syllabuses for a degree curriculum.

‘Professional core’ refers to the study requirements, including a capstone experience,
prescribed in the regulations and syllabuses for disciplinary studies in degree curricula
which are not structured as major/minor programmes for reasons relating to professional
qualification and/or accreditation.

1 These regulations are applicable to candidates admitted from 2016-17 onwards to the first year of first
degree curricula under the 4-year ‘2012 curriculum’, the 2-year curriculum in respect of the BSc(IM), the
5-year curriculum in respect of the BA&BEd(LangEd), BEd&BSc, BEd&BSocSc, BSc(Sp&HearSc), and
BNurs, and the 6-year curriculum in respect of the BChinMed, BDS and MBBS. Reference in these
regulations to the powers of the Boards of Faculties shall be applicable to Senate Boards of Studies which
administer first degree curricula.

(The Regulations for First Degree Curricula applicable to cohorts admitted in 2012-13 and 2013-14 under the
4-year ‘2012 curriculum’ can be found in the Calendar for 2013-14, and in the Calendar for 2014-15 for the
cohorts admitted in 2014-15 and 2015-16.)
‘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.

‘Disciplinary elective course’ or ‘Disciplinary Elective’ means any course offered in the same major or minor programme or the professional core which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabuses of the degree curriculum.

‘Elective course’ or ‘Elective’ means any course offered within the same or another curriculum, other than compulsory courses in the candidate’s degree curriculum, that can be taken by the candidate in order to complete the credit requirements of the degree curriculum.

‘Capstone experience’ refers to one or more courses within the major programme or professional core which are approved by the Board of the Faculty for the purpose of integrating knowledge and skills acquired, and which are prescribed in the syllabuses of the degree curriculum.

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

‘Prerequisite’ means a course or a group of courses which candidates must have completed successfully or a requirement which candidates must have fulfilled before being permitted to take the course in question.

‘Corequisite’ means a course which candidates must take in conjunction with the course in question.

‘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.

‘Grade Points’ are standardized measurements of candidates’ academic achievement in courses taken to satisfy the requirements of the degree curriculum and are expressed as a scale prescribed in these regulations.

‘Grade Point Average’ is a numerical measure of a candidate’s academic achievement over a specified period of time. Each course attempted (including each failed course) is assigned a numerical value, with all courses carrying equal weighting. This numerical value is the product of grade points earned for the course and the credit value of that course. The ‘Grade Point Average’ is the sum of these numerical values divided by the total number of credits attempted:

\[ GPA = \frac{\sum \text{Course Grade Points} \times \text{Course Credit Value}}{\sum \text{Course Credit Value}} \]

(where ‘i’ stands for all passed and failed courses taken by the student over a specified period)

‘Semester Grade Point Average’ or ‘Semester GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) during a given semester.

‘Year Grade Point Average’ or ‘Year GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) during a given academic year.

‘Cumulative Grade Point Average’ or ‘Cumulative GPA’ is the GPA in respect of courses attempted by a candidate (including failed courses) at the time of calculation.

‘Assessment’ refers to judgment about the quality and extent to which a student has achieved the stated learning objectives or learning outcomes. It includes all types of assessment activities which allow for such a judgment to be made. For the purpose of interpreting the relevant provisions of the Ordinance and the Statutes and where appropriate,
reference to ‘examination’ or ‘examinations’ in the Ordinance and the Statutes shall include and cover all forms of ‘assessment’ and its related processes.

A ‘transcript’ refers to a transcript of the record of study of a candidate, issued by the Registry of the University.

UG 2 Advanced standing:

Advanced standing may be granted to candidates in recognition of studies completed successfully in an approved institution of higher education elsewhere. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with the following principles:

(a) at least half the number of credits of the degree curriculum normally required for award of the degree shall be accumulated through study at this University or from transfer of credits for courses completed at other institutions in accordance with Regulation UG 4(d); and

(b) in accordance with Statute III.5 and notwithstanding the granting of advanced and/or transfer credits, a minimum of two semesters of study at this University shall be required before a candidate is considered for the award of a first degree, other than a degree in medicine or surgery, and a minimum of four semesters of study at this University shall be required before a candidate is considered for a first degree in medicine or surgery.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

UG 3 Period of study:

The period of study of the curriculum shall be specified in the regulations governing the degree. To be eligible for award of the degree, a candidate shall fulfill all curriculum requirements within the maximum period of registration, unless otherwise permitted or required by the Board of the Faculty.

UG 4 Progression in curriculum:

(a) 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 is fewer than 24 credits.

(b) 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 for the normative period of study specified in the curriculum regulations, save as provided for under UG4(c).

(c) 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 for the maximum period of registration specified in the curriculum regulations.
(d) 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 may be recorded in 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.

(e) Unless otherwise permitted by the Board of the Faculty, candidates shall be recommended for discontinuation of 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 (not including the summer semester), or

(iii) exceeded the maximum period of registration specified in the regulations of the degree.

UG 5 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to the requirements prescribed in the regulations and syllabuses governing the degree curriculum within the maximum period of registration:

(a) successful completion of 12 credits in English language enhancement, including 6 credits in Core University English\(^2\) and 6 credits in an English in the Discipline course\(^3\);

(b) successful completion of 6 credits in Chinese language enhancement\(^4\);

(c) successful completion of 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry\(^5\) with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits; and

(d) successful completion of a capstone experience as specified in the syllabuses of the degree curriculum.

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\(^2\) Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu, see Regulation UG6.

\(^3\) (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates’ home Faculty.

(b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates’ home Faculty.

(c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

\(^4\) Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take an elective course in lieu, see Regulation UG6.

\(^5\) Candidates registered for double degree studies are required to successfully complete 24 credits of courses in the Common Core Curriculum, selecting one course from each Area of Inquiry, within the curriculum of the first degree, as appropriate.
UG 6 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

UG 7 Assessment:

(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 passed 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 as prescribed in the curriculum regulations:

(i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or

(ii) re-submitting failed coursework, without having to repeat the same course of instruction; or

(iii) repeating the failed course by undergoing instruction and satisfying the assessments; or

(iv) for elective courses, taking another course in lieu and satisfying the assessment requirements.

(e) There shall be no appeal against the results of examinations and all other forms of assessment.

UG 8 Grading system:

(a) The grades, their standards and the grade points for assessment shall be as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>Excellent</td>
<td>4.3</td>
</tr>
<tr>
<td>A</td>
<td>Excellent</td>
<td>4.0</td>
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<tr>
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<td>Excellent</td>
<td>3.7</td>
</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>B-</td>
<td>Good</td>
<td>2.7</td>
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<td>C+</td>
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<td>2.3</td>
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<tr>
<td>D+</td>
<td>Pass</td>
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<td>D</td>
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<td>1.0</td>
</tr>
<tr>
<td>F</td>
<td>Fail</td>
<td>0</td>
</tr>
</tbody>
</table>

6 UG 8 is not applicable to the respective Professional Core of the BDS and MBBS curricula.
(b) Special permission may be given by Senate for courses in individual curricula to be graded as ‘Pass’, ‘Fail’ or ‘Distinction’. Such courses will not be included in the calculation of the GPA.

**UG 9  Honours classifications:**

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses) carrying equal weighting:

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<td>(2.40 – 3.59)</td>
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<td>2.40 – 2.99</td>
</tr>
<tr>
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<td>1.70 – 2.39</td>
</tr>
<tr>
<td>Pass</td>
<td>1.00 – 1.69</td>
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</table>

(b) Honours classification may not be determined solely on the basis of a candidate’s Cumulative GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.

(c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

---

7 UG 9 is not applicable to the BChinMed, BDS and MBBS curricula.
## Teaching Weeks

### First Semester: Sep 1 - Dec 23, 2017

<table>
<thead>
<tr>
<th>Week</th>
<th>SUN</th>
<th>MON</th>
<th>TUE</th>
<th>WED</th>
<th>THUR</th>
<th>FRI</th>
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</table>

**First Day of Teaching: Sep 1, 2017**

**Reading/ Field Trip Week: Oct 16 - 21, 2017**

**Last Day of Teaching: Nov 30, 2017**

**Revision Period: Dec 1 - 7, 2017**

**Assessment Period: Dec 8 - 23, 2017**

### Second Semester: Jan 15 - May 26, 2018

<table>
<thead>
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<th>Week</th>
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**First Day of Teaching: Jan 15, 2018**

**Reading/ Field Trip Week: Mar 5 - 10, 2018**

**Last Day of Teaching: Apr 28, 2018**

**Revision Period: Apr 30 - May 5, 2018**

### Optional Summer Semester

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<th>Week</th>
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<th>WED</th>
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</table>

**JUN 25 - AUG 18, 2018**

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**Notes:**

- First Semester: 11 Mondays, 12 Tuesdays and Wednesdays, 11 Thursdays, 12 Fridays and 11 Saturdays
- Second Semester: 12 Mondays, 13 Tuesdays and Wednesdays, 11.5 Thursdays, 11 Fridays and 12 Saturdays

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**General Holiday**

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**Reading/ Field Trip Week**

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**Revision Period**

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**University Holiday (afternoon only)**

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**Class Suspension Period for the Lunar New Year**

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**Assessment Period**

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## Useful contacts and websites

**Faculty of Science**  
Office Location : Ground Floor,  
Chong Yuet Ming Physics Building  
Tel : 3917 2683  
Fax : 2858 4620  
Email : science@hku.hk  
Website : http://www.scifac.hku.hk  

*Please visit http://www.scifac.hku.hk for the latest updates of BSc courses, timetables, notices and forms*

**Departments/School**  
- Biological Sciences  
  Website : http://www.biosch.hku.hk  
- Biomedical Sciences  
  Website : http://www.sbms.hku.hk  
- Chemistry  
  Website : http://www.chemistry.hku.hk  
- Earth Sciences  
  Website : http://www.earthsciences.hku.hk  
- Mathematics  
  Website : http://www.math.hku.hk  
- Physics  
  Website : http://www.physics.hku.hk  
- Statistics and Actuarial Science  
  Website : http://www.saasweb.hku.hk

**Academic Advising Office**  
Tel : 2219 4686  
Website : http://aa.o.hku.hk

**Academic Services Office**  
Office Location : G04, Run Run Shaw Building  
Tel : 2859 2433  
Fax : 2540 1405  
Email : asoffice@hku.hk  
Website : http://www.ase.hku.hk

**Common Core courses**  
Website : http://commoncore.hku.hk

**HKU Worldwide Undergraduate Exchange Programme**  
Website : http://www.als.hku.hk/admission/exchange

**Centre of Development and Resources for Students (CEDARS)**  
Website : http://cedars.hku.hk

**University Health Service**  
Tel : 2859 2305  
Fax : 2549 4686 (Medical appointments only)  
Website : http://www.uhs.hku.hk

**Plagiarism**  
Website : http://www.hku.hk/plagiarism