Bachelor of Science

(4-year Curriculum)

Major in Risk Management
Minor in Actuarial Studies
What is Risk Management?

- **Risk Management** is a logical and systematic methodology of studying the risks involved in any activity or process.
How to avoid or minimize potential losses?

How to help managers make best use of their available resources?
Risk Management practices are widely used in public and the private sectors. Examples are:

- Finance and Investment
- Insurance
- Health Care
- Natural Hazards
- Governments
Risk Management - Interdisciplinary

- An all-rounded risk manager should have a combined skill that includes concepts and techniques from many fields:
  - Statistics and financial econometrics
  - Actuarial modeling
  - Mathematical finance
  - Other skills: communication skill and computer programming skill
Professional Qualification

- **Financial Risk Manager (FRM) Certificate Exam**
  - awarded by Global Association of Risk Professionals (GARP)  
    [https://www.garp.com](https://www.garp.com) (founded in 1996)

- **Professional Risk Managers (PRM) Exam**
  - awarded by Professional Risk Managers’ International Association (PRMIA)  
    [https://www.prmia.org](https://www.prmia.org)

- **Chartered Enterprise Risk Actuary (CERA)**
  - awarded by CERA Global Association  
    [https://ceraglobal.org](https://ceraglobal.org)
7 introductory level courses (42 credits)

- SCNC1111 Scientific method & reasoning
- SCNC1112 Fundamentals of modern science
- *MATH1013 University mathematics II
- *MATH2014 Multivariable calculus & linear algebra
- *STAT1600 Statistics: ideas & concepts
- *STAT2601 Probability and statistics I
- *STAT2602 Probability and statistics II

* replaced by other advanced level STAT course(s) if above course(s) already taken to fulfill other majors/minors
Mathematical background adequate?

- Students must have **level 2 or above** in HKDSE Extended Module 1 or 2 of Mathematics or equivalent

- Otherwise, strongly advised to take **MATH1011 University Mathematics I** in Semester 1.
What do we need from your Mathematics?

- Set notation and theory
- Functions (*incl.* limits, continuity)
- Sequences, series
- Basic calculus (*incl.* partial differentiation, double integration)
- Vectors, matrices (basic operations)
# Suggested / Example Structure of BSc (Major in Risk Management) Curriculum

<table>
<thead>
<tr>
<th>Year</th>
<th>One</th>
<th>Two</th>
<th>One</th>
<th>Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester</td>
<td>One</td>
<td>Two</td>
<td>One</td>
<td>Two</td>
</tr>
<tr>
<td>Disciplinary Core</td>
<td>MATH1013 University Mathematics II</td>
<td>MATH2014 Multivariable Calculus and Linear Algebra</td>
<td>STAT2601 Probability and Statistics I</td>
<td>STAT2602 Probability and Statistics II</td>
</tr>
<tr>
<td></td>
<td>STAT1600 Statistics: Ideas and Concepts</td>
<td></td>
<td></td>
<td>STAT3615 Practical Mathematics for Investment</td>
</tr>
<tr>
<td>Science Foundation Courses</td>
<td>SCNC1111 Scientific Method and Reasoning</td>
<td>SCNC1112 Fundamentals of Modern Science</td>
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<td></td>
</tr>
<tr>
<td>Common Core</td>
<td>Six common core courses within the first three years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language</td>
<td>CAES1000 Core University English (offered in both semesters)</td>
<td></td>
<td>CAES9821 Professional and Technical Communication for Mathematical Sciences (offered in both semesters)</td>
<td></td>
</tr>
</tbody>
</table>
Flow Chart of Disciplinary Courses for BSc Major in Risk Management

S1 = Offered in 1st Semester
S2 = Offered in 2nd Semester

- 12 credits

<table>
<thead>
<tr>
<th>Pre-requisite</th>
<th>Co-requisite</th>
</tr>
</thead>
</table>

**Year 1**

- **STAT1600**
  - Statistics: Ideas and Concepts

- **SCNC1111**
  - Scientific Method and Reasoning

- **SCNC1112**
  - Fundamentals of Modern Science

- **CAES1000**
  - Core University English

**Year 2**

- **MATH1013**
  - University Mathematics II

- **STAT2601**
  - Probability and Statistics I

- **MATH2014**
  - Multivariable Calculus and Linear Algebra

- **STAT2602**
  - Probability and Statistics II

**Year 2 or 3**

- **STAT3609 (S1)**
  - The Statistics of Investment Risk

- **STAT3610 (S2)**
  - Risk Management and Insurance

- **STAT3615 (S2)**
  - Practical Mathematics for Investment

**Year 3 or above**

- **STAT3600**
  - Linear Statistical Analysis

- **STAT3601 (S1)**
  - Stochastic Processes

- **STAT3603 (S1)**
  - Statistical Machine Learning

- **STAT3612 (S1)**
  - Derivatives and Risk Management

- **STAT3615 (S2)**
  - Credit Risk Analysis

- **STAT3616 (S2)**
  - Risk Management and Basel Accords in Banking and Finance

- **STAT3617 (S2)**
  - Risk Management and Basel Accords in Banking and Finance

**Capstone:**

- **STAT3799**
- **STAT4710**
- **STAT4766**
- **STAT4799**

**Further Information:**

4 Core advanced level courses (24 credits)

** STAT3600  Linear statistical analysis
* STAT4601  Time-series analysis
STAT3609  The statistics of investment risk
STAT3615  Practical mathematics for investment

** also core to Decision Analytics / Statistics Major
* also core to Statistics Major
Other advanced level courses (24 credits)

- Four courses to be selected from...

- STAT3603 Stochastic processes
- STAT3612 Statistical machine learning
- STAT3911 Financial economics II
- STAT4607 Credit risk analysis
- STAT4608 Market risk analysis

- STAT3610 Risk management & insurance
- STAT3618 Derivatives & risk management
- STAT4603 Current topics in risk management
- STAT4606 Risk management & Basel Accords in banking and finance
Capstone requirement
(6 credits)

At least 6 credits from:

- STAT3799  Directed studies in statistics (6 credits)
- STAT4799  Statistics project (12 credits)
- STAT4710  Capstone experience for statistics undergraduates (6 credits)
- STAT4766  Statistics internship (6 credits)
Major in Risk Management vs Major in Statistics

- All 7 introductory level courses **SAME**
- Advanced level core courses:
  - **2 SAME, 2 DIFFERENT**

- **Risk Management** –
  courses focus primarily on business-related topics: e.g.
  - investment, insurance, finance, banking, etc.

- **Statistics** –
  courses cover wide range of topics with emphasis on
  - “METHODS”, their applications, and underlying theory.

- Students **CANNOT** double major or major/minor in
  - Risk Management & Statistics
Minor in Actuarial Studies
(42 credits)

- **Introductory level courses** (12 credits)

  *2 courses from…*

- FINA1310  Corporate finance
- MATH1013  University mathematics II
- STAT2601  Probability and statistics I
- STAT2602  Probability and statistics II
- STAT2605  Demographic and socio-economic statistics
- STAT2901  Probability and statistics:
  foundations of actuarial science
Minor in Actuarial Studies

**Advanced level courses** (30 credits)

*5 courses from…*

- STAT3615  Practical mathematics for investment
- STAT3901  Life contingencies
- STAT3904  Corporate finance for actuarial science
- STAT3906  Risk theory I
- STAT3908  Credibility theory and loss distributions
- STAT3910  Financial economics I
- STAT3911  Financial economics II
- STAT4903 Actuarial techniques for general insurance
A new introductory-level course

STAT2604

Introduction to R programming and elementary data analysis

- introduction to statistical programming language R
- basic programming skills in R with examples and applications in elementary statistical analysis
- management of different data types: input/output, manipulation, transformation
- random sampling, descriptive data analysis
- production of professional summary reports with high-quality graphs
Reminder

- plan ahead
- watch out for pre-requisites of individual courses
- courses **CANNOT** be double-counted to fulfill different majors/minors

*(exception for double major in Science:)*

**SCNC1111 & SCNC1112 & up to 12 credits** of compulsory courses

*REQUIRED by both Science majors can be double-counted)*

- consult course selection advisors if necessary
Contact Persons

- Co-ordinator
  - Ke Zhu

- Course Selection Advisors
  - C W Kwan
  - Stephen M S Lee
  - K Zhu

- Tel: 3917 2466

- Email: ug_enquiry@saas.hku.hk
Support from University and Department

- **Department**: Computing facilities
  - two statistical computer laboratories
  - up-to-date software for teaching, learning, research
Support from University and Department

- **HKU**: Centre of Development and Resources for Students
  - NETmatch, NETjobs, JIJIS (Joint Institutions Job Info. System)
- **Department**: Internship / Job Online Application System

Contact person:
Dr C W Kwan
<cwkwan@hku.hk>
Career Development Training

- **Summer IT course:**
  - Essential IT skills (certificate course)

- **Career Advising Programme (CAP) to prepare students for:**
  - Internships and job opportunities
  - Advancing resume and interview skills
# Exchange study

## Faculty of Science  
**Course Equivalence Database**  
(for credit transfer reference):

https://webapp.science.hku.hk/student/servlet/course_equiv

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## Contact person:  
Dr ZHU Ke  
<mazhuke@hku.hk>

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## COURSE EQUIVALENCE DATABASE

<table>
<thead>
<tr>
<th>No.</th>
<th>Partner Code</th>
<th>Partner Credit/Unit</th>
<th>Partner Title</th>
<th>HKU Code</th>
<th>HKU Credit</th>
<th>HKU Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ACTSC 231</td>
<td>0.5</td>
<td>Introductory Financial Mathematics</td>
<td>STAT3615</td>
<td>6</td>
<td>Practical mathematics for investment</td>
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<tr>
<td>2.</td>
<td>ACTSC 331</td>
<td>0.5</td>
<td>Life Contingencies 2</td>
<td>STAT3909</td>
<td>6</td>
<td>Advanced life contingencies</td>
</tr>
<tr>
<td>3.</td>
<td>ACTSC 371</td>
<td>0.5</td>
<td>Introduction to Investments</td>
<td>STAT3609</td>
<td>6</td>
<td>The statistics of investment risk</td>
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<tr>
<td>4.</td>
<td>ACTSC 372</td>
<td>0.5</td>
<td>Corporate Finance</td>
<td>STAT3904</td>
<td>6</td>
<td>Corporate finance for actuarial science</td>
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<tr>
<td>5.</td>
<td>ACTSC 432</td>
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<td>Loss Models 2</td>
<td>STAT3908</td>
<td>6</td>
<td>Credibility theory and loss distributions</td>
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<tr>
<td>6.</td>
<td>ACTSC 433</td>
<td>0.5</td>
<td>Analysis of Survival Data</td>
<td>STAT3955</td>
<td>6</td>
<td>Survival analysis</td>
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<tr>
<td>7.</td>
<td>ACTSC 445</td>
<td>0.5</td>
<td>Quantitative Enterprise Risk Management</td>
<td>STAT4608</td>
<td>6</td>
<td>Market risk analysis</td>
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<tr>
<td>8.</td>
<td>ACTSC 446</td>
<td>0.5</td>
<td>Mathematical Models in Finance</td>
<td>STAT3911</td>
<td>6</td>
<td>Financial economics II</td>
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<tr>
<td>9.</td>
<td>ACTSC 453</td>
<td>0.5</td>
<td>Basic Pension Mathematics</td>
<td>STAT3956</td>
<td>6</td>
<td>Pension funds and pension mathematics</td>
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<tr>
<td>10.</td>
<td>ACTSC 462</td>
<td>0.5</td>
<td>Introduction to Property and Casualty Pricing</td>
<td>STAT3954</td>
<td>6</td>
<td>Current topics in actuarial science</td>
</tr>
<tr>
<td>11.</td>
<td>ACTSC 463</td>
<td>0.5</td>
<td>Introduction to Property and Casualty Loss Reserving</td>
<td>STAT4903</td>
<td>6</td>
<td>Actuarial techniques for general insurance</td>
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Scholarships

- Available to students majoring in Risk Management / Statistics / Decision Analytics based on academic performance and/or other qualities
Faculty-sponsored 2-week overseas study exchange tour to France

National School for Statistics and Data Analysis
- Rennes, France

Ecole nationale de la statistique et de l’analyse de l’information (ENSAI in French)
Student Peer Advisers in 2019-20

• General roles
  – to **offer advice** in relation to academic studies to freshmen; and
  – to **facilitate** freshmen’s **smooth transition** from secondary to university education

• Matching between **Student Peer Advisers (SPAs)** and freshmen starting from 2019-20

• You are highly encouraged to contact the following SPAs if you have any questions about your study (their contacts can be found at the Faculty’s website)
  – Miss DING Zhui (Rose) (BSc Year 2)
  – Mr JUSUF Joshuandy (BSc Year 3)
  – Miss MARVELLA Jennifer (BSc Year 3)
  – Mr WONG Ka Wai (Spring) (BSc Year 4)
Q & A