The Chinese University of Hong Kong
Faculty of Science
Science Academy for Young Talent

Summer Courses 2023
Course Outline
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SAYT1006 Risk Management and Actuarial Science
風險管理與精算學

Introduction:	The uncertainty in an event or an activity is known as risk. Risks are encountered in trivial events such as travelling and in professional activities such as business partnership. We take risk every day. This course provides a broad perspective on both current practices and mathematical theories of risk management. Topics include qualitative and quantitative classifications of risks, mathematical modelling of financial markets and derivatives, current financial issues and crises, and statistical analysis of financial data, mathematics of insurance and Actuarial Science. This course is designed for the students who are interested in the scientific and mathematical aspects of risk management, financial market and actuarial science.
	任何事件或活動的不確定性皆可視為風險。我們於日常中會遭遇到各項大大小小的風險。小如平日生活之衣食住行、大如商業之投機活動，風險總是伴隨左右。本課程為風險管理的實際應用和數學理論提供廣泛概要。本課程涵蓋範圍包括：風險的質化與量化分類，金融市場與衍生產品的數學建模，現今金融的課題與危機，金融數據的統計分析，保險數學與精算。本課程為有興趣於風險管理，金融市場或精算學之數理概念的同學而設。
Medium of Instruction:	Cantonese supplemented with English 粵語輔以英語
Organising Unit:	Department of Statistics, Faculty of Science, CUHK
Teachers:	**Dr. LEUNG Sze Him, Isaac (梁思謙博士)** Lecturer Department of Statistics, CUHK Room 120, Lady Shaw Building, CUHK E-mail: shleung@cuhk.edu.hk

Course Content:

29 July 2023 (Saturday) 9:00 am – 12:30 pm 2:00 pm – 5:00 pm	**Lecture: Overview of Risk Management** • Risk and management • Qualitative and quantitative aspects of risks • Random variables • Probability distributions **Computer-lab Session: Introduction to R language and data acquisition**
5 August 2023 (Saturday) 9:00 am – 12:30 pm 2:00 pm – 5:00 pm	**Lecture: Measures of risk** • Distribution function and quantile • Value at risk (VaR) • Conditional value at risk (cVaR) • **Computer-lab Session: Computing various risk measures**
12 August 2023 (Saturday) 9:00 am – 12:30 pm 2:00 pm – 5:00 pm	**Lecture: Modelling of Market and Financial Products – Part I** • Stock prices and limit order market • Futures and options as financial derivatives for hedging and leverage • One-step binomial tree • No-arbitrage principle and risk-neutral probability **Computer-lab Session: Simulation techniques for pricing derivatives**
19 August 2023 (Saturday) 9:00 am – 12:30 pm 2:00 pm – 5:00 pm	**Lecture: Modelling of Market and Financial Products – Part II** • Vector and matrix operations • Portfolio allocation • Markowitz portfolio theory **Computer-lab Session: Hedge fund manager case Study**
26 August 2023 (Saturday) 9:00 am – 12:30 pm 2:00 pm – 5:00 pm	**Lecture: Actuarial Science** • Life contingency table • Survival modelling and actuarial theories • Pricing insurance products **Computer-lab Session: Evaluation of insurance contracts**
2 September 2023* (Saturday) 9:00 am – 12:30 pm 2:00 pm – 5:00 pm	Make-up Class

Duration	5 whole day sessions (total 30 contact hours)
Date	29 July, 5, 12, 19, 26 August 2023 2 September 2023* (make up class)
Time	9:30 am – 12:30 pm & 2:00 pm – 5:00 pm
Teaching Mode	Face to Face (The Chinese University of Hong Kong)
Enrollment	30
Expected Applicants	Students who are promoting to or studying S4 – S6 with good knowledge in mathematics, knowledge in economic is preferable but not necessarily
Tuition Fee	HKD 3,900.00 (Students who have attended all sessions will be granted a HKD 1000 scholarship)
Credit	1 University Unit [#] Certificate of completion will be awarded to students who pass the assessment (if applicable) and attain at least 75% attendance.
Grading Methods	Letter grades range from A to F.

* This date is reserved for make-up classes in case there is any cancellation of classes due to unexpected circumstances.

[#] *This credit can only be used to apply exemption from the 1 credit course **RMSC1101 Elementary Concepts in Risk Management**.*