City University of Hong Kong
Course Syllabus

offered by College/School/Department of __Information Systems__
with effect from Semester __A 2022 / 23__

Part I   Course Overview

Course Title:	Leading Risk Management Initiatives with Big Data
Course Code:	IS6423
Course Duration:	One Semester (13 weeks)
Credit Units:	3
Level:	P6
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Nil
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

This course aims to develop students' analytical knowledge and skills to perform risk management for various business sectors by emphasising the use of big data driven approaches and tools.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Describe taxonomy of risk and the basic concepts of risk management.	15%			
2.	Design data driven risk measures to quantify risk for local and international organizations.	30%	✓	✓	
3.	Apply big data analytical tools for the design and implementation of effective risk identification and mitigation methodology.	40%	✓	✓	✓
4.	Demonstrate good communication and interpersonal skills in presenting risk mitigation strategies for local and international businesses.	15%			
		100%			

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.
A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.
A3: *Accomplishments*
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
TLA1: Lecture	Concepts of risk management, taxonomy of risk, and the design of data driven methodology for risk identification and risk mitigation are introduced.	✓	✓	✓		
TLA2: Case Studies	Examples of financial disasters, credit risk, and operational risk are discussed and presented to students.	✓	✓	✓	✓	
TLA3: Demonstrations and hands-on exercises	Demonstrations and practices of the application of big data driven approaches for risk identification and risk mitigation are provided.		✓	✓	✓	
TLA4: Practical	Developing the hands-on skills for the design of big data driven risk measures, risk identification, and risk prediction.		✓	✓	✓	
TLA5: On-Line Discussion	On-Line Discussion: It is a means of self-reflection and sharing concepts, techniques, and methods for big data driven risk management.	✓	✓		✓	

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.						Weighting	Remarks
	1	2	3	4				
Continuous Assessment: 60%								
AT1.Seminar Participation and Exercises: Each seminar consists of lecture, exercises, small group discussions, self-reflection, and student presentations to assess students' understanding of the chosen topics and their abilities to apply their skills.	✓	✓	✓				20%	
AT2: Group Project A group project, which includes a project report and presentation, will be allocated to let students practise on the analytical knowledge and skills acquired.		✓	✓	✓			40%	
Examination: 40% (duration: 2 hours)								
AT3: Examination A written examination is developed to assess student's competence level of the taught subjects.	✓	✓	✓				40%	
							100%	

Note: Students must pass BOTH coursework and examination in order to get an overall pass in this course.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Mariginal (B-, C+, C)	Failure (F)
1. AT1: Seminar Participation and Exercises	Ability to accurately and profoundly describe all key concepts of data driven risk management; effectively compare and discriminate among the key concepts;	High	Significant	Moderate	Not even reaching marginal levels
	Capability to reasonably and effectively design data driven risk measures to identify risk for local and international organizations;	High	Significant	Moderate	Not even reaching marginal levels
	Capability to effectively and creatively apply big data analytical tools to develop risk identification and mitigation methodology for both local and international organizations;	High	Significant	Moderate	Not even reaching marginal levels
2. AT2: Group Project	Capability to reasonably and effectively design data driven risk measures to identify risk for local and international organizations;	High	Significant	Moderate	Not even reaching marginal levels
	Capability to effectively and creatively apply big data analytical tools to develop risk identification and mitigation methodology for both local and international organizations;	High	Significant	Moderate	Not even reaching marginal levels
	Demonstrates a cogent ability to integrate communication skills so that ideas are communicated in the most cost-effective way.	High	Significant	Moderate	Not even reaching marginal levels
3. AT3: Examination	Ability to accurately and profoundly describe all key concepts of data driven risk management; effectively compare and discriminate among the key concepts;	High	Significant	Moderate	Not even reaching marginal levels
	Capability to reasonably and effectively design data driven risk measures to identify risk for local and international organizations;	High	Significant	Moderate	Not even reaching marginal levels
	Capability to effectively and creatively apply big data analytical tools to develop risk identification and mitigation methodology for both local and international organizations;	High	Significant	Moderate	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. AT1: Seminar Participation and Exercises	Ability to accurately and profoundly describe all key concepts of data driven risk management; effectively compare and discriminate among the key concepts;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to reasonably and effectively design data driven risk measures to identify risk for local and international organizations;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to effectively and creatively apply big data analytical tools to develop risk identification and mitigation methodology for both local and international organizations;	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. AT2: Group Project	Capability to reasonably and effectively design data driven risk measures to identify risk for local and international organizations;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to effectively and creatively apply big data analytical tools to develop risk identification and mitigation methodology for both local and international organizations;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Demonstrates a cogent ability to integrate communication skills so that ideas are communicated in the most cost-effective way.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. AT3: Final Exam	Ability to accurately and profoundly describe all key concepts of data driven risk management; effectively compare and discriminate among the key concepts;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to reasonably and effectively design data driven risk measures to identify risk for local and international organizations;	High	Significant	Moderate	Basic	Not even reaching marginal levels
	Capability to effectively and creatively apply big data analytical tools to develop risk identification and mitigation methodology for both local and international organizations;	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III   Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

   Introduction to Risk Management
   - Taxonomy of risk – market, credit, liquidity, operational, etc.
   - Examples of financial and operational disasters

   Data Driven Risk Measures
   - Risk measures for various asset classes
   - Parametric value at risk, portfolios value at risk, data driven tools for value at risk
   - modern portfolio theory, extreme value theory, multifactor models, Six Sigma, Balanced Scorecards

   Big Data for Risk Management
   - Concepts of Big Data, Big Data analytical tools
   - Monte Carlo (MC) simulations, GARCH volatility models, model risk

2. **Reading List**
2.1 **Compulsory Readings**
   (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2 **Additional Readings**
   (Additional references for students to learn to expand their knowledge about the subject.)

1.	Arvind Sathi, Big Data Analytics: Disruptive Technologies for Changing the Game, Mc Press, 2013. ISBN: 978-1583473801
2.	Victoria Lemieux, Financial Analysis and Risk Management: Data Governance, Analytics and Life Cycle Management, Springer, 2013. ISBN: 978-3642322310
3.	Paul Hopkin, Fundamentals of Risk Management: Understanding, Evaluating and Implementing Effective Risk Management, Kogan Page, Second Edition, 2012. ISBN: 978-0749465391
4.	Jorion, Philippe, Value at Risk: The New Benchmark for Managing Financial Risk, 3rd edition, McGraw-Hill, 2007. ISBN: 978-0071464956
5.	Roger Lowenstein, When Genius Failed: The Rise and Fall of Long-Term Capital Management, Random House, 2001. ISBN: 978-0375758256

2.3 **Online Resources**

   Course reading materials will be augmented by articles from journals, whitepapers, and other materials available on-line.