City University of Hong Kong
Course Syllabus

offered by Department of Economics and Finance
with effect from Semester A 2024/25

Part I   Course Overview

Course Title: **Credit Risk Management**

Course Code: **EF5340**

Course Duration: **1 semester**

Credit Units: **3**

Level: **P5**

Medium of Instruction: **English**

Medium of Assessment: **English**

Prerequisites:
(Course Code and Title)   **Nil**

Precursors: **EF5050 Derivatives and Risk Management and**
(Course Code and Title)   **EF5070 Financial Econometrics or EF5250 Stochastic Calculus for Finance**

Equivalent Courses:
(Course Code and Title)   **EF5161 Management of Financial Institutions (from the old curriculum)**

Exclusive Courses:
(Course Code and Title)   **Nil**

Part II   Course Details

1.   **Abstract**

Credit investments have long been existing in the financial markets for over centuries.   However, modern credit risk management techniques have only achieved significant breakthroughs after 2000, primarily due to the implementation of the global bank regulatory standards set out in the Basel III Framework which mandates internationally active banks to strengthen their institutional credit risk management framework and match their credit risk with sufficient regulatory capital.   These initiatives motivate banks to spend huge resources to enhance their credit risk management systems with qualified risk management skills.

This course aims at introducing the credit risk management techniques under the latest Basel III Framework and discussing a wide range of methodologies that enable banks to measure their credit risk with contemporary financial technologies. The course is particularly beneficial to those working in the following areas: risk management, compliance, bank audit, corporate banking, retail banking and private banking.

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.	Discuss the credit risk factors and analyse the credit risk of common debt products.	10%	√	√	
2.	Access the credit quality of borrowers using credit rating, FICO score and machine learning.	20%	√	√	√
3.	Explain the credit risk of homogenous and heterogeneous debt portfolios.	10%		√	√
4.	Justify and mitigate the credit risk of single debt and debt portfolio.	10%		√	√
5.	Discuss the properties of major credit derivatives, including CDS, CLN and CDO.	15%	√	√	
6.	Analyse credit regulations using generative AI.	10%	√	√	
7.	Describe the philosophy behind the IFRS 9 and Basel III Framework.	10%	√	√	√
8.	Demonstrate the capital charge for credit risk of debt and securitization exposures.	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 real-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. Learning and Teaching Activities (LTAs)
(LTAs designed to facilitate students' achievement of the CILOs.)

LTA	Brief Description	CILO No.								Hours/week(if applicable)
		1	2	3	4	5	6	7	8	
Lectures with audio-visual illustration	Students will be engaged in instructor-led lectures, using presentation slides and work examples as the major tools.	√	√	√	√	√	√	√	√	-
Hands-on computer laboratory examples: Microsoft Excel implementation of credit risk models	Students will participate in implementing the theories using real life examples and calculations.	√	√	√	√				√	-
Hands on computer laboratory examples: KNIME implementation of machine learning models	Students will estimate probability of default using machine learning.		√							-
Hands-on computer laboratory examples: Poe.com AI	Students will research and analyse the latest credit regulations using AI.						√			-
Excel worksheet implementation of capital charge calculation approaches	Students will participate in calculating the capital charges following the regulatory rules					√		√	√	-

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	5	6	7	8		
Continuous Assessment: 50 %										
Term project	√	√	√	√	√	√	√	√	50%	- To assess the credit quality of several companies using machine learning; presentation of analysis results - To recommend a lending strategy; presentation of analysis results - To mitigate the credit risk of a debt basket after deterioration using credit derivatives; participation in class discussion - To calculate the capital charge of a debt basket before/ after deterioration and before/ after credit risk mitigation; proposal of the most appropriate capital charge calculation approach
Examination: 50 % (duration: 3 hours)										
									100%	

Students are required to pass both coursework and examination components in order to pass the 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 before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Term project	Please see note 1 below	Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. Students have demonstrated very strong overall ability to discover and innovate, and shown very strong evidence of accomplishments of discovery.	Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature. Students have demonstrated strong overall ability to discover and innovate, and shown strong evidence of accomplishments of discovery.	Students who is profiting from the university experience; understanding of the subject; ability to develop solutions to simple problems in the material. Students have demonstrated some overall ability to discover and innovate, and shown some evidence of accomplishments of discovery.	Sufficient familiarity with the subject matter to enable the student to progress without repeating the course. Students have demonstrated marginal overall ability to discover and innovate, and shown marginal evidence of accomplishments of discovery.	Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited, or irrelevant use of literature. Students have demonstrated little overall ability to discover and innovate, and shown little evidence of accomplishments of discovery.
2. Examination	Please see note 2 below					

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Term project	Please see note 1 below	Strong evidence of original thinking; good organization, capacity to analyse and synthesize; superior grasp of subject matter; evidence of extensive knowledge base. Students have demonstrated very strong overall ability to discover and innovate, and shown very strong evidence of accomplishments of discovery.	Evidence of grasp of subject, some evidence of critical capacity and analytic ability; reasonable understanding of issues; evidence of familiarity with literature. Students have demonstrated strong overall ability to discover and innovate, and shown strong evidence of accomplishments of discovery.	Sufficient familiarity with the subject matter to enable the student to progress without repeating the course. Students have demonstrated marginal overall ability to discover and innovate, and shown marginal evidence of accomplishments of discovery.	Little evidence of familiarity with the subject matter; weakness in critical and analytic skills; limited, or irrelevant use of literature. Students have demonstrated little overall ability to discover and innovate, and shown little evidence of accomplishments of discovery.
2. Examination	Please see note 2 below				

Note 1:
- Successfully assess the credit quality of listed companies with credit ratings, Merton's corporate default model and Altman's Z-scores;
- Successfully measure the credit risk of individual debts in a basket with expected loss;
- Successfully mitigate the credit risk of individual debts with EAD, LGD, PD and maturity reductions and/or using credit derivatives;
- Successfully calculate the capital charge for credit risk of debt exposures with the standardized and IRB approaches; and
- Successfully identify the most appropriate approach for a bank to calculate its capital charges for credit risk.

Note 2:
- Able to assess the credit quality of corporate and retail borrowers;
- Able to measure the credit risk of individual debts, homogenous debt portfolios and heterogeneous debt portfolios;
- Able to monitor and mitigate the credit risk of individual debts and debt portfolios;
- Able to hedge the credit risk of individual debts and debt portfolios with credit derivatives;
- Able to create new credit products with credit derivatives and through credit structuring; and
- Able to calculate the capital charges for a bank's credit exposures.

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.)

    Credit risk factors, credit assessments, credit machine learning, debt portfolios, credit risk monitoring, credit risk controls, credit derivatives, credit securitizations, financial tsunami 2008, credit provisioning, capital charge, Basel III framework, standardized approach, internal ratings based approach

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.	Lam, Kwan and Lai (2018). Managing Credit Risk Under The Basel III Framework (Third Edition)

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

    Optional Reference Book

1.	Baesen, Roesch, Scheule (2016). Credit Risk Analytics: Measurement Techniques, Applications, and Examples in SAS.
2.	Löeffler and Posch (2011). Credit Risk Modeling using Excel and VBA (Second Edition).