EF5340: CREDIT RISK MANAGEMENT

Effective Term
Semester B 2024/25

Part I Course Overview

Course Title
Credit Risk Management

Subject Code
EF - Economics and Finance
Course Number
5340

Academic Unit
Economics and Finance (EF)

College/School
College of Business (CB)

Course Duration
One Semester

Credit Units
3

Level
P5, P6 - Postgraduate Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
EF5050 Derivatives and Risk Management and EF5070 Financial Econometrics or
EF5250 Stochastic Calculus for Finance

Equivalent Courses
EF5161 Management of Financial Institutions (from the old curriculum)

Exclusive Courses
Nil

Part II Course Details

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.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Discuss the credit risk factors and analyse the credit risk of common debt products.	10	x	x	
2	Access the credit quality of borrowers using credit rating, FICO score and machine learning.	20	x	x	x
3	Explain the credit risk of homogenous and heterogeneous debt portfolios.	10		x	x
4	Justify and mitigate the credit risk of single debt and debt portfolio.	10		x	x
5	Discuss the properties of major credit derivatives, including CDS, CLN and CDO.	15	x	x	
6	Analyse credit regulations using generative AI.	10	x	x	
7	Describe the philosophy behind the IFRS 9 and Basel III Framework.	10	x	x	x
8	Demonstrate the capital charge for credit risk of debt and securitization exposures.	15		x	x

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.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures with audio-visual illustration	Students will be engaged in instructor-led lectures, using presentation slides and work examples as the major tools.	1, 2, 3, 4, 5, 6, 7, 8	-

2	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.	1, 2, 3, 4, 8	-
3	Hands on computer laboratory examples: KNIME implementation of machine learning models	Students will estimate probability of default using machine learning.	2	-
4	Hands-on computer laboratory examples: Poe.com AI	Students will research and analyse the latest credit regulations using AI.	6	-
5	Excel worksheet implementation of capital charge calculation approaches	Students will participate in calculating the capital charges following the regulatory rules	5, 7, 8	-

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Term project	1, 2, 3, 4, 5, 6, 7, 8	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

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

3

Additional Information for ATs

Students are required to pass both coursework and examination components in order to pass the course.

Assessment Rubrics (AR)

Assessment Task

Term project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Please see note 1 below

Excellent

(A+, A, A-) 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.

Good

(B+, B, B-) 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.

Fair

(C+, C, C-) 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.

Marginal

(D) 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.

Failure

(F) 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.

Assessment Task

Examination (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Please see note 2 below

Excellent

(A+, A, A-) 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.

Good

(B+, B, B-) 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.

Fair

(C+, C, C-) 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.

Marginal

(D) 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.

Failure

(F) 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.

Assessment Task

Term project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Please see note 1 below

Excellent

(A+, A, A-) 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.

Good

(B+, B) 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.

Marginal

(B-, C+, C) 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.

Failure

(F) 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.

Assessment Task

Examination (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Please see note 2 below

Excellent

(A+, A, A-) 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.

Good

(B+, B) 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.

Marginal

(B-, C+, C) 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.

Failure

(F) 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.

Additional Information for AR

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

Keyword Syllabus

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

Reading List

Compulsory Readings

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

Additional Readings

	Title
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).