澳門理工大學
Universidade Politécnica de Macau
Macao Polytechnic University

FACULTY OF BUSINESS

MASTER OF SCIENCE IN FINANCE WITH DATA ANALYTICS

LEARNING MODULE OUTLINE

Academic Year	2024 / 2025	Semester	2
Module Code	FIDA6102-121		
Learning Module	Derivative Securities		
Pre-requisite(s)	N/A		
Medium of Instruction	English		
Credits	3	Contact Hours	45hrs.
Instructor	Daniel Chen	Email	t1871@mpu.edu.mo
Office	B110	Office Phone	---

MODULE DESCRIPTION

This module introduces (1) the structure and operation of derivative markets (options, forward contracts, futures, swaps, and other derivatives) and the fundamental concepts of these derivative securities, (2) the necessary skills used in valuing derivatives, (3) the hedging of derivatives, and (4) applications of derivatives in the areas of risk management, portfolio insurance, and financial engineering.

MODULE INTENDED LEARNING OUTCOMES (ILOS)

On completion of this learning module, students will be able to:

M1.	Describe the general features of derivative securities such as forwards, futures, swaps and options.
M2.	Calculate the price of derivatives and profits of derivative positions.
M3.	Design/evaluate derivative strategies for hedging and/or speculative purposes.
M4.	Demonstrate good written and oral communications skills, with the ability to communicate clearly to both specialist and non-specialist audiences on current local and global financial derivatives issues.
M5.	Demonstrate good skills in time management, working with others and independent study.

These ILOs aims to enable students to attain the following Programme Intended Learning Outcomes (PILOs):

Knowledge and Understanding On completion of this programme, students will be able to:					
PILOs	**M1**	**M2**	**M3**	**M4**	**M5**

PI	Master critical knowledge of financial theories, financial models and data analytics in finance and apply it to a wide range of complex financial issues.	√	√	√		
PI	Expand knowledge of finance and data analytics through critically evaluating current issues informed by leading edge research and practice in the industry.	√	√	√		
Skills and Attributes On completion of this programme, students will be able to:						
PI	Conduct applied research, particularly using data analytics, into financial issues through a rigorous and systematic approach.	√	√	√		
PI	Communicate effectively, written and orally, to both professional and non-professional audiences on local and global financial issues.				√	
PI	Demonstrate skills in time management, teamwork, leadership and independent study so that tasks can be planned and implemented at a professional level.					√
PI	Identify and address ethical dilemmas and social responsibility issues to uphold high standards of integrity, professionalism and ethical behaviour.					

MODULE SCHEDULE, COVERAGE AND STUDY LOAD

Week	Content Coverage	Contact Hours
1	Introduction and Mechanics of Futures Markets (Chapter 1, 2)	3 hrs.
2	Hedging Strategies Using Futures (Chapter 3)	3 hrs.
3	Interest Rates (Chapter 4)	3 hrs.
4	Determination of Forward and Futures Prices （Chapter 5）	3 hrs.

5	Interest Rate Futures (Chapter 6)	3 hrs.
6	Swaps (Chapter 7)	3 hrs.
7	Securitization, the Credit Crisis and XVAs (Chapter 8,9)	3 hrs.
8	Mechanics of Option Markets and Properties of Options (Chapter 10,11)	3 hrs.
9	Trading Strategies Involving Options and Binomial Trees (Chapter 12,13)	3 hrs.
10	The Black–Scholes–Merton Model (Chapter 15)	3 hrs.
11	Options on Stock Indices, Currencies and Futures (Chapter 17, 18)	3 hrs.
12	The Greek letters (Chapter 19)	3 hrs.
13	Volatility smiles and Volatility Surfaces (Chapter 20)	3 hrs.
14	Derivatives mishaps and what we can learn from them (Chapter 37)	3 hrs.
15	Final Examination	3 hrs.
	Total	45 hrs.

TEACHING AND LEARNING ACTIVITIES

In this learning module, students will work towards attaining the ILOs through the following teaching and learning activities:

Teaching and Learning Activities	**M1**	**M2**	**M3**	**M4**	**M5**
Interactive lectures • Lectures: in-depth coverage of principles of accounting is presented with PowerPoint slides and other supplementary materials if necessary • Q & As: time is allowed to raise questions from both sides (instructor and students)	✓	✓	✓	✓	✓
In-class Exercises and quizzes • In-class exercises will be discussed at the end of each lecture to ensure student understanding of the issues. • Quizzes: students will take some quizzes to motivate them to review what they have learned	✓	✓	✓	✓	✓
Assignments • Students are required to complete assigned questions and problems. No late submission will be accepted.	✓	✓	✓	✓	✓

ATTENDANCE

Attendance requirements are governed by the "Academic Regulations Governing Master's Degree Programmes of Macao Polytechnic University". Students who have less than the required attendance for the enrolled subject are not eligible to attend the final and re-sit examinations and will be given an "F" as their final grade.

ASSESSMENT

In this learning module, students are required to complete the following assessment activities:

Assessment Activities	**Weighting (%)**	**ILOs to be Assessed**
Q&A / Participation	5%	M1, M2, M3, M4
Assignments	20%	M1, M2, M3, M4, M5
Projects	25%	M1, M4, M5
Final Exam	50%	M1, M2, M3, M4
Total:	100%	

The assessment will be conducted following the University's Assessment Strategy (see www.mpu.edu.mo/teaching_learning/en/assessment_strategy.php). Passing this learning module indicates that students will have attained the ILOs of this learning module and thus acquired its credits.

MARKING SCHEME

	Assessment Task	Criterion	Excellent (A, A-)	Very Good, Good (B+, B, B-)	Satisfactory (C+, C, C-)	Pass (D+, D)	Fail (F)
1.	Class Learning Activities (including participation, Q&A, quizzes)	Demonstrate the **understanding** of the subjects covered in classes and show active learning attitude	High	Significant	Moderate	Basic	Not even reaching marginal levels
2.	Assignments	Demonstrate the **ability** to answer questions on topics covered in the outline	High	Significant	Moderate	Basic	Not even reaching marginal levels
3.	Project	Demonstrate the **understanding** and **ability** to identify related problems, analyze pros and cons, and provide recommendations	High	Significant	Moderate	Basic	Not even reaching marginal levels
4.	Final exam	Demonstrate the **ability** to **identify** and **apply**	High	Significant	Moderate	Basic	Not even reaching

		appropriate concepts, methods and techniques					marginal levels

REQUIRED READINGS

Module textbook:

John C. Hull, 2022, Options, Futures, and Other Derivatives, 11th Edition, Pearson.

REFERENCES

Reference book(s)

1. Robert L. McDonald, 2013, Derivatives Markets, 3rd Edition, Pearson.
2. Don M. Chance, Robert Brooks, 2016, Introduction to Derivatives and Risk Management, 10th Edition, Cengage.
3. Kerry Back, 2005, A Course in Derivative Securities: Introduction to Theory and Computation, Springer.

Journal(s)

1. Journal of Finance
2. Review of Financial Studies
3. Journal of Financial Economics
4. Journal of Derivatives

Website(s)

Prof. John C. Hull's website: http://www-2.rotman.utoronto.ca/~hull/

STUDENT FEEDBACK

At the end of every semester, students are invited to provide feedback on the learning module and the teaching arrangement through questionnaires. Your feedback is valuable for instructors to enhance the module and its delivery for future students. The instructor and programme coordinators will consider all feedback and respond with actions formally in the annual programme review.

ACADEMIC INTEGRITY

The Macao Polytechnic University requires students to have full commitment to academic integrity when engaging in research and academic activities. Violations of academic integrity, which include but are not limited to plagiarism, collusion, fabrication or falsification, repeated use of assignments and cheating in examinations, are considered as serious academic offenses and may lead to disciplinary actions. Students should read the relevant regulations and guidelines in the Student Handbook which is distributed upon the admission into the University, a copy of which can also be found at www.mpu.edu.mo/student_handbook/.