

**THE UNIVERSITY OF HONG KONG**  
**FACULTY OF BUSINESS AND ECONOMICS**

**FINA2322 - Derivatives**

**GENERAL INFORMATION**

**Semester 1**

**FINA2322ABC**

Instructor: Dr. Thomas Maurer

Email: maurer@hku.hk

Office: Room 837 K K Leung Building

Subclass A: TBD

Subclass B: TBD

Subclass C: TBD

Subclass D: TBD

Consultation times: TBD

**Semester 2**

**FINA2322EFG**

Instructor: Dr. Yang Liu

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Office: Room 1005 K K Leung Building

Phone: 2859 1050

Subclass E: TBD

Subclass F: TBD

Subclass G: TBD

Consultation times: TBD

Pre-requisites: ECON1210 Introductory microeconomics and FINA1310 Corporate finance

Co-requisites: NA

Mutually exclusive: IMSE3010/IMSE4110 Financial engineering; STAT2820/STAT3905

Introduction to financial derivatives; STAT3303/STAT3618 Derivatives and risk management, and STAT2812/STAT3910 Financial economics I

Remarks: NOT OPEN to students taking or having taken MATH2906/MATH3906 Financial Calculus

Course Website: MOODLE via HKU portal

Other information: refer to supplementary information provided by individual instructor later

**COURSE DESCRIPTION**

The major objective of this course is to promote an in-depth understanding of basic derivatives. Derivatives have become a popular hedging and investment tool over the last several decades and derivatives concepts are required for every advanced finance topic. This course provides students with a framework to understand the fundamental concepts of derivative products (forward and futures, options, swaps, and basic structured products), to develop the necessary skills used in valuing derivative contracts, and to understand a wide variety of issues related to risk management and investment decisions using derivatives.

<b>COURSE OBJECTIVES</b>		
<ol style="list-style-type: none"> <li>1. To provide a comprehensive introduction to the design, uses and management of financial derivatives, including futures, options and some structured products.</li> <li>2. To offer a theoretical framework within which derivatives can be analyzed and valued.</li> <li>3. To provide a solid foundation for advanced courses of the program such as fixed income securities and financial engineering.</li> </ol>		
<b>FACULTY GOALS</b>		
Goal 1: Acquisition and internalization of knowledge of the program discipline		
Goal 2: Application and integration of knowledge		
Goal 3: Inculcating professionalism		
Goal 4: Developing global outlook		
Goal 5: Mastering communication skills		
Goal 6: Cultivating leadership		
<b>COURSE LEARNING OUTCOMES</b>		
<b>Course Learning Outcomes</b>	<b>Aligned Faculty Goals</b>	
<b>CLO1.</b> Describe and interpret the general features of basic types of derivatives securities.	Goal 1, 3, 6	
<b>CLO2.</b> Identify the basic risk management strategies and design option trading strategies for hedging, speculation or arbitrage. Understand the leadership role in monitoring risk management process.	Goal 1, 2, 4, 5	
<b>CLO3.</b> Apply the No Arbitrage Principle to price financial forwards and futures and swaps in an efficient financial market.	Goal 1, 2	
<b>CLO4.</b> Understand the design and application of forward rate agreement and Eurodollar futures.	Goal 1, 2	
<b>CLO5.</b> Illustrate the put-call parity and other pricing relations between calls and puts using no-arbitrage principle.	Goal 1, 2	
<b>CLO6.</b> Apply binomial approach in pricing European and American options.	Goal 1, 2	
<b>CLO7.</b> Explain the Black-Scholes option formula for the price of a European option and its Greeks. Understand the idea of delta-hedging.	Goal 1, 2 5	
<b>CLO8.</b> Apply option pricing theory in the area of financial engineering and corporate finance (if time permits).	Goal 2, 3, 4, 5, 6	
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>		
<b>Course Teaching and Learning Activities</b>	<b>Expected contact hour</b>	<b>Study Load (% of study)</b>

T&L1. Lectures	36 hours	27.27%
T&L2. Assignments	36 hours	27.27%
T&L3. Tutorials	12 hours	9.09%
T&L4. Self-study	48 hours	36.36%
<b>Total</b>	132 hours	100%

<b>Assessment Methods</b>	<b>Weights</b>	<b>Aligned Course Learning Outcomes</b>
A1. In-Class Performance & Assignments	40%	CLO 1, 2, 3, 4, 5, 6, 7, 8
A2. Midterm/Take home Examinations	60%	CLO 1, 2, 3, 4, 5, 6, 7, 8
Total	100%	

### STANDARDS FOR ASSESSMENT

#### Course Grade Descriptors

A+, A, A-	Exhibited high level of understanding of the course materials through excellent performance in class discussion, assignments and term tests.
B+, B, B-	Exhibited reasonably high level of understanding of the course materials through good performance in class discussion, assignments, and term tests.
C+, C, C-	Exhibited fair level of understanding of the course materials.
D+, D	Exhibited limited level of understanding of the course materials.
F	Exhibited low level of understanding of the course materials.

#### Assessment Rubrics for Each Assessment

##### A1 In-Class Performance (Classroom discussions)

<b>A+ A A-</b>	<b>B+ B B-</b>	<b>C+ C C-</b>	<b>D+ D</b>	<b>F</b>
Extremely well prepared for class discussion, very active in sharing views and attended almost all lectures and tutorials.	Partially prepared for class discussion, quite active in sharing views and attended most of the lectures and tutorials	Not well prepared for class discussion, limited active in sharing views and attended many of the lectures and tutorials.	Not well prepared for class discussion, no sharing of views and attended some of the lectures and tutorials	Poorly prepared for class discussion and no sharing of views and experience and rarely attended lectures and tutorials.

##### A1 In-Class Performance (Presentations)

<b>A+ A A-</b>	<b>B+ B B-</b>	<b>C+ C C-</b>	<b>D+ D</b>	<b>F</b>
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Professional presentation style, comprehensive content coverage, well-articulated on critical issues, effective use of concepts.	Decent presentation style, appropriate content coverage, clear discussion of critical issues, moderately effective use of concepts.	Mediocre presentation style, limited content coverage, marginally acceptable discussion of critical issues, infrequent use of concepts.	Weak presentation style, key content omitted, unclear focus on critical issues, very limited use of concepts.	Unacceptable presentation style, questionable content coverage, omitting critical issues, zero use of concepts.
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**A1 Assignments: for numerical questions/homework, please refer to the following table:**

<b>A+ A A-</b>	<b>B+ B B-</b>	<b>C+ C C-</b>	<b>D+ D</b>	<b>F</b>
Submitted all homework with excellent accuracy.	Submitted well written homework with good accuracy.	Submitted homework with fair level accuracy.	Submitted homework with limited accuracy.	Poorly written homework or no submission.

**A1 Assignments: for essay type problems, please refer to the following grading criteria:**

<b>Grade</b>	<b>Depth and breadth of Coverage, critical elements, structure, language and conventions</b>
A+,A, A-	<p>All aspects were addressed and researched in great depth.</p> <p>Demonstrated a clear understanding of and the ability to apply the theory, concepts and issues relating to the topic.</p> <p>Clearly identified the most critical aspects of the task and adopted a critical perspective.</p> <p>Developed excellent argument and offered a logically consistent and well-articulated analysis and insight into the subject.</p> <p>Drew widely from the academic literature and elsewhere whilst maintaining relevance.</p> <p>All aspects conformed to a high academic / professional standard.</p>
B+, B, B-	<p>Most aspects were addressed and researched in depth.</p> <p>Demonstrated a good understanding and some application of the theory and issues relating to the topic.</p> <p>Identified critical aspects of the task and adopted a critical perspective.</p> <p>Showed some evidence of analysis, supported by logical argument and insight into the subject.</p> <p>Drew on relevant academic and other material.</p> <p>Most aspects conformed to a high academic / professional standard.</p>

C+, C, C-	<p>Most aspects were addressed and researched adequately.</p> <p>Demonstrated a good understanding of the theory, concepts and issues relating to the topic but limited application relating to the topic.</p> <p>Some presented argument showed some insight but not always consistent and logical.</p> <p>Drew upon an adequate range of academic and other material.</p> <p>Most aspects conformed to an acceptable academic / professional standard.</p>
D+, D	<p>Basic aspects were addressed and researched adequately. Demonstrated mainly description, showing basic understanding of the topic but no application.</p> <p>Showed little evidence of analysis but no clear and logical argument relating to the subject.</p> <p>Drew primarily upon course materials.</p> <p>Limited aspects conformed to academic / professional standards.</p>
F	<p>Basic aspects were superficial, inadequate or absent.</p> <p>Demonstrated limited understanding of the topic and drew conclusions unrelated to the topic.</p> <p>The written work was not of an academic / professional standard.</p>

## A2 Midterm/Take-home Examinations

Midterm and take-home exams may include three types of questions: multiple choice, calculation problems, and essay questions. Multiple choice and calculation problems are graded according to the marks assigned to each question. Essay questions are graded according to the following criteria:

A+ A A-	B+ B B-	C+ C C-	D+ D	F
Idea development is insightful and sophisticated; Supporting evidence is convincing, accurate and detailed. Well written with clear focus.	Idea development is clear and thoughtful; Supporting evidence is sufficient and accurate. Well written.	Idea development is simplistic and lacking in relevance; Supporting evidence insufficient but accurate. Somewhat well written.	Idea development is superficial and ineffective; Supporting evidence is insufficient and inaccurate. Writing is unclear.	Idea development is absent; Supporting evidence is vague or missing. Poorly written.

## COURSE CONTENT AND TENTATIVE TEACHING SCHEDULE

The following topics will be covered:

- Introduction to Derivatives
- An Introduction to Forwards and Options

- Insurance, Collars, and Other Strategies
- Introduction to Risk Management
- Financial Forwards and Futures
- Commodity Forwards and Futures
- Interest Rate Forwards and Futures
- Swaps
- Parity and Other Option Relationships
- Binomial Option Pricing
- The Black-Scholes Formula
- Market-Making and Delta-Hedging
- Financial Engineering and Application (if time permits)

### REQUIRED/RECOMMENDED READINGS & ONLINE MATERIALS

1. McDonald, Robert L., 2013, *Derivatives Markets*, 3<sup>rd</sup> edition, or Hull, John C., 2018, *Options, Futures, and Derivatives*, Prentice-Hall, 10<sup>th</sup> edition.
2. Lecture Notes prepared by the instructor, which will be made available on Moodle

### MEANS/PROCESSES FOR STUDENT FEEDBACK ON COURSE

- conducting mid-term survey in addition to SETL around the end of the semester

### COURSE POLICY

#### Class Conduct

Students are required to attend all classes on time. If you miss a class, it is entirely your responsibility for what you have missed. In case you have to leave the class early, please inform the instructor beforehand and leave quietly.

No use of mobile phone or chatting is allowed when the class is in session. Remember to turn off or mute the phone before each session. The instructor has the discretion to give penalty in case of class misconduct.

Respect your instructors and your fellow students. Be considerate to others.

#### Academic Dishonesty

The University Regulations on academic dishonesty will be strictly enforced! Please check the University Statement on plagiarism on the web: <http://www.hku.hk/plagiarism/>

Academic dishonesty is any act that misrepresents a person's own academic work or that compromises the academic work of another. It includes (but not limited to) cheating on assignments or examinations; plagiarizing, i.e., representing someone else's ideas as if they are one's own; sabotaging another's work.

If you are caught in an act of academic dishonesty or misconduct, you will receive an "F" grade for the subject. The relevant Board of Examiners may impose other penalty in relation to the seriousness of the offense.

## **ADDITIONAL COURSE INFORMATION**

- Announcement, assignments, and lecture slides will be posted on the course MOODLE website. Hard copy of lecture notes will not be provided.
- No late assignments will be accepted. A peer evaluation may be conducted to survey group assignment contribution at the end of the term. Those who under-contribute will be penalized.