# COURSE CODE: QF602

**COURSE TITLE: Derivatives**

Instructor : Dr Harry Lo

Title : TBD

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## PRE-REQUISITE/CO-REQUISITE/MUTUALLY EXCLUSIVE COURSE(S)

None

## COURSE AREA

Quantitative Finance

## GRADING BASIS

Graded

## COURSE UNIT

1 CU

## FIRST OFFERING TERM

Academic Year: AY2019 Academic Term: Term 2

## COURSE DESCRIPTION

Derivatives are financial instruments that deliver cash flows based on the value of an external factor, such as the price of a physical commodity or financial asset. Derivatives have become a staple tool of the financial industry, giving rise to a wealth of innovative (and occasionally dangerous) financial engineering. This course will provide an introduction to the characteristics and properties of standard derivatives such as forwards, futures, options and swaps. We will investigate how derivatives can be used for financial hedging and speculation, and also how they should be priced in an arbitrage-free market.

## LEARNING OBJECTIVES

On successful completion of the course, students should be able to:

* Describe the characteristics and cash flows of standard derivatives.
* Explain how derivatives can be used for hedging and speculation.
* Calculate the price and value of forward and futures contracts.
* Calculate the value of option contracts using the Black– Scholes, Bachelier and shifted lognormal option pricing model.
* Calculate the price and value of various option strategies and structured products.
* Calculate the sensitivities/Greeks of various option strategies and structured products.

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| **ASSESSMENT METHODS** |  |
| Class Participation: | 10% |
| Homework Assignments: | 30% |
| Final Examination: | 60% |
| **Total:** | **100%** |

Attendance and Class Participation

Students are required to attend all lectures. Credit will be given to students who ask questions during lectures, or otherwise provide relevant input.

Homework Assignments

There will be regular homework assignments. Students may discuss the homework problems, but each student must individually submit a completed homework assignment.

Final Exam

There will be a two- to three-hour examination at the end of the course. The exam will cover all material that is presented during the lectures. Students will be allowed to use an electronic calculator during the exam. Students will also be allowed to refer to a double-sided A4-sized formula sheet of their own design.

## ACADEMIC INTEGRITY

All acts of academic dishonesty (including, but not limited to, plagiarism, cheating, fabrication, facilitation of acts of academic dishonesty by others, unauthorized possession of exam questions, or tampering with the academic work of other students) are serious offences.

All work presented in class must be the student’s own work. Any student caught violating this policy may result in the student receiving zero marks for the component assessment or a fail grade for the course. This policy applies to all works (whether oral or written) submitted for purposes of assessment.

When in doubt, students are encouraged to consult the instructors of the course. Details on the SMU Code of Academic Integrity may be accessed at [http://www.smuscd.org/resources.html.](http://www.smuscd.org/resources.html)

## REFERENCE TEXTS

Students may also wish to refer to

1. *Options, Futures, and Other Derivatives*, 10th edition by John Hull, Pearson Education, 2017 (or earlier editions)
2. *Exotic Options and Hybrids,* by Bouzoubaa & Osseiran, Wiley, 2010

for further discussion of the topics covered in the lectures.

# SCHEDULE

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| **Session** | **Topic** |
| 1 | Introduction to Derivatives |
| 2 | Option Strategies |
| 3 | Option pricing Models |
| 4 | Greeks |
| 5 | Volatility Smile and Barrier Options |
| 6 | More on Option Pricings |
| 7 | Structure Products |
| 8 | Revision |