



BUSINESS SCHOOL  
Te Kura Pakihi

## COURSE OUTLINE

# ***FINC 306*** ***Derivatives***

Semester Two, 2020

This course outline contains information specific to this paper. For more general information common to your papers, please refer to the COMMERCE\_UG\_2018: Commerce Undergraduate Students site on Blackboard.

## Paper Description and Aims

Derivative securities are the most rapidly growing area in the global financial market. In 2010, the notional global market value of derivatives was USD 605 trillion, 10 times world GDP. It was USD 629 trillion in December 2014, USD 483 trillion in December 2016. That of primary financial assets was only twice world GDP in 2010. Given the growing large size of the derivative market, a careful study of derivative securities becomes very important to a financial analyst.

The purpose of this course is to provide a comprehensive analysis on the properties of options and futures and to offer a theoretical framework within which all derivatives can be valued and hedged. Topics covered: Option strategies and static replication, no-arbitrage principle and forward price formula, the current value of a forward contract and futures trading, forward rate and forward rate agreement, swaps, model-free relationships between option prices, binomial tree model, the Black-Scholes formula, and financial engineering and security design.

Prerequisite: FINC 202 Investment Analysis & Portfolio Management

## Learning Outcomes

Upon successful completion of this paper, you should be able to:

1. Understand the concepts of forward and futures contracts, and how to price them using no-arbitrage principle
2. Understand the concept and pricing of swaps
3. Price options using binomial tree method
4. Price options using Black-Scholes formula
5. Analyse the derivatives embedded in structured products

## Teaching Staff

### Paper Coordinator and Lecturer

Name: Jin Zhang  
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Office Hours: Tue & Thu @ 14:00-14:50

### Head Tutor

Name: Pakorn (Beam) Aschakulporn  
Office: OBS3.30  
Email: beam.aschakulporn@otago.ac.nz  
Office Hours: Mon @ 13:00-13:50

## Tutor

Name: Jungah (Isabella) Yoon  
Office: OBS3.30  
Email: Isabella.yoon@postgrad.otago.ac.nz  
Office Hours: Fri @ 13:00-13:50

You should contact Pakorn (Beam) Aschakulporn with any administrative enquiries about the paper, e.g. tutorial changes, or requests for late submission of assignments.

## Class Representatives

Class representatives are an important means of communication between students and staff. Contact details for your student class representatives can be found on the Course page for this paper.

## Course Delivery

Lecture Day/Time: Thu @ 15:00-16:50 Weeks: 28-34,36-41

Room: QUAD4

Tutorials Day/Time: Tue @ 14:00-15:50 in OBS228, Tue @ 16:00-17:50 in OBS228

Wed @ 14:00-15:50 in OBS228, Wed @ 16:00-17:50 in OBS228

Every week students must attend two 50 minute lectures and two 50 minute tutorials each week.

**Lectures** present the key conceptual material through discussion and interaction between teaching staff and students. Lectures are supported by readings.

**In-class exercises** posted from time to time during the lecture are designed for students to practice immediately the new concepts and skills. Active participations in discussion are expected for all students.

**Tutorials** are interactive, collaborative sessions in which students attempt to cement concepts presented at lectures with their peers in a supportive environment.

Tutorials begin in the **second** week of semester. You will be allocated to a tutorial and this will be available in eVision.

Tutorials offer you the opportunity to work in groups on a series of tasks designed to apply the concepts that you have been exposed to in class and from your reading, and to stimulate your interest in the course as it applies to “everyday” issues. The key feature of tutorials, as opposed to lectures and individual study, is participation of all members of the tutorial group. **Please prepare for tutorials before going to them.**

**The Course Calendar** (in this outline) details scheduling information. Note that this calendar may change as the course proceeds. Any changes will be announced at lectures and be detailed on the Course page

# Course Learning Resources

## Textbook

McDonald, Robert L., 2013, *Derivatives Markets*, 3<sup>rd</sup> edition, Pearson Higher Education, Inc.  
McDonald, Robert L., 2009, *Fundamentals of Derivatives Markets*, Pearson Education, Inc.

Either one is acceptable for us. The second book is derived from first half of the first book.

## Course page

Course page <https://sites.google.com/site/jinzhanghomepage/home/teach/finc306> provides you with access to course materials, class notices, and resources.

Blackboard <https://blackboard.otago.ac.nz/> is used to email the whole class so it is important that you check your student email regularly.

Further information about student support, learning support and information, academic integrity and other University resources for students is available on the COMMERCE\_UG\_2017: Commerce Undergraduate Students site on Blackboard.

## Student Webmail

We will use your student email account to email you information relevant to your programme. To forward your University email address to an email address that you use regularly:

1. Log into your Student Mail account (<http://www.otago.ac.nz/smlanding/>) using your student username and password.
2. Click the **Cog** button (top right corner).
3. Click on **Mail** under **Your App Settings**.
4. Under **Accounts** on left hand side, select **Forwarding**.
5. Under the Forwarding heading, type in the email address you want your email to be forwarded to. You can also choose to have a copy of these emails kept on your StudentMail account, so please check the box if you would like this.
6. Click the **Save** button.

## Assessment

All material presented is examinable (except where stated otherwise) by assignments and the final examination. All-important assessment information such as due dates and times, content, guidelines and so on will be discussed at lectures and, where appropriate, detailed on Course page. *Students are responsible for ensuring that they are aware of this information, keeping track of their own progress, and catching up on any missed classes.*

Assessment	% of final grade
Individual class contribution	10
Two assignments	20
Midterm exam	20
Final exam	50

# Course Requirements

## *Attendance and In-class Participation*

The material of this paper is highly sequential. To ensure that students gain the maximum benefit from classes, students are required to attend each lecture and tutorial. Attendance will be checked in each tutorial and randomly in lectures. ***Students are required to attend at least 70% of classes of this paper; otherwise they may be treated as having failed the whole course.*** Attendance will be considered in assigning points for the individual class contribution.

In addition to attendance, in-class exercise will be posted from time to time during the lecture and/or tutorial. Credits will be awarded to those who provide directly related comments and suggestions. Students should also prepare to be called upon for input to solving the problems

## *Assignments*

I plan to give **two assignments**. You are required to work on them individually. Discussion among classmates is allowed. Please turn in your solutions on the due date. Late turn-in will be heavily discounted. Remember to put your names and student IDs on the first page of your manuscripts.

## *Midterm Exam*

The **midterm exam** will be in class on **20 Aug 2020 (Thu)**. The main purpose of the midterm is to test your understanding of the fundamental concepts and your ability of doing some basic calculations. Please bring your calculator!

## *The Comprehensive Final Examination*

A **three-hour final examination** will be comprehensive of all course topics and materials. It will be given according to the semester schedule. No make-up examination will be given unless the student consults with the instructor prior to the scheduled date of the examination and provides documents to support the reason for missing the scheduled examination.

## Learning Outcomes

Learning Outcome	Assessment	Assessment	Assessment	Exam	Total
Understand the concepts of forward and futures contracts, and how to price them using no-arbitrage principle	In-class exercises	Assignment 1	Midterm exam	Final exam	35%
Understand the concept and pricing of swaps	In-class exercises		Midterm exam	Final exam	15%
Price options using binomial tree method	In-class exercises	Assignment 2		Final exam	25%
Price options using Black-Scholes formula	In-class exercises	Assignment 2		Final exam	20%
Analyse the derivatives embedded in structured products	In-class exercises			Final exam	5%
<b>Total</b>	10%	20%	20%	50%	100%

# Course Calendar

	<b>Week Commencing</b>	<b>Topic</b>	<b>Reading</b>	<b>Notes</b>
1	Monday 6 July	Introduction	Chapter 1 & 2	
2	Monday 13 July	Option Strategies and Static Replication	Chapter 3	
3	Monday 20 July	No-Arbitrage Principle and Forward Price Formula	Chapter 5	
4	Monday 27 July	The Current Value of a Forward Contract and Futures Trading	Chapter 5	
5	Monday 3 August	Forward Rate and Forward Rate Agreements	Chapter 7	Assignment 1 due 6 Aug
6	Monday 10 August	Swaps	Chapter 8	
7	Monday 17 August	Midterm exam in class on 20 August		
<b>Mid Semester Break 24 – 28 August</b>				
8	Monday 31 August	Model-Free Relationships between Option Prices	Chapter 9	
9	Monday 7 September	Binomial Tree Model	Chapter 10	
10	Monday 14 September	Binomial Tree Model	Chapter 10	
11	Monday 21 September	The Black-Scholes Model	Chapter 11	
12	Monday 28 September	Financial Engineering and Security Design		Assignment 2 due 1 Oct
13	Monday 5 October	Review		

**Lectures End Friday 9 October 2020**  
**University Exam Period 14 October – 6 November 2020**

## Disclaimer

While every effort is made to ensure that the information contained in this document is accurate, it is subject to change. Changes will be notified in class and via Course page. Students are encouraged to check Course page regularly. It is the student's responsibility to be informed.