UNSW Course Outline

FINS5535 Derivatives and Risk Management Techniques - 2024

Published on the 28 Jan 2024

General Course Information

Course Code : FINS5535
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : UNSW Business School
Academic Unit : School of Banking and Finance
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

An intermediate course on options, futures and techniques for managing asset risk. Topics covered include an overview of derivative securities, forward and futures contracts (on stock indices, investment and consumptive assets), options (on stocks, stock indices and futures),

hedging positions in options and other derivative securities, binomial option pricing, risk-neutral valuation, the stochastic process followed by stocks, numerical techniques in option pricing, options on non-traded assets, exotic options and pricing biases.

Course Aims

This course provides the basis to analyze and solve a variety of problems related to derivative securities. The course consists of weekly three-hour lectures plus six hours of structured learning. The lecture notes will be available before class, so that students can have an overview of the topics in advance. During the lecture, we discuss the details of the lecture notes, and answer various questions that are left unanswered in the notes. We discuss the intuition behind results and regularly refer to the “big picture” issues, of how each topic relates to other topics. Questions and discussion in class are welcome. Practice problems will be made available as the course progresses, and doing these should help students prepare for the exams as well as the assignment. The assessments will be based on the lecture notes and practice problems.

Relationship to Other Courses

The aims of the course are to:

Provide a rigorous understanding of different derivative instrumentsDevelop working knowledge on the use of derivatives in risk managementProvide necessary skills to value options and futures.

This course is introductory in nature. It does, however, assume a working knowledge of finance concepts, including time value of money, and of higher mathematics, including probability distribution and calculus. There is some overlap with material discussed in Security Valuation, though the course will explore these topics in much greater depth. Students interested in Interest Rate Derivatives or Applied Portfolio Management will benefit from concepts explained in FINS5535. Students also need to be able to use a word processing package (such as WORD) and a spreadsheet (such as EXCEL). Some quantitative skill such as basic mathematical ability in dealing with algebraic manipulation is expected.

Course Learning Outcomes

Course Learning Outcomes	Program learning outcomes
CLO1 : Understand futures and forward contracts, using them for hedging, defining an optimal hedge ratio, and pricing them using no-arbitrage arguments.	• PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO2 : Understand currency swap contracts, the comparative advantage argument, and their pricing.	• PLO1 : Business Knowledge
CLO3 : Understand options payoffs, using those payoffs to find (i) bounds on options, (ii) the put call parity relationship, and (iii) interesting combinations of options, while understanding the motivation for investing in them.	• PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO4 : Understand how to price call and put options using binomial trees, based on delta-hedging (no-arbitrage) arguments, and risk-neutral pricing.	
CLO5 : Understand the Black-Scholes option pricing model, including some of the mathematics behind the model (such as Wiener processes and Ito's lemma).	• PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO6 : Understand how to price options on futures, options on stocks paying dividends and dividend yields, and options on currencies. We also discuss the early exercise of American call options on these assets.	• PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO7 : Understand and use the options Greek letters, which explain the price sensitivity of options to changes in underlying variables, such as the stock price, time, the risk-free rate, and volatility. Also, understand how the Greek letters help with hedging.	• PLO1 : Business Knowledge • PLO2 : Problem Solving
CLO8 : Understand how to extend the binomial model to price American options on futures, indices, and currencies, as well as calculating the Greek letters for American options using binomial trees.	• PLO1 : Business Knowledge • PLO2 : Problem Solving

Course Learning Outcomes	Assessment Item
CLO1 : Understand futures and forward contracts, using them for hedging, defining an optimal hedge ratio, and pricing them using no-arbitrage arguments.	• Midterm Test
CLO2 : Understand currency swap contracts, the comparative advantage argument, and their pricing.	• Midterm Test
CLO3 : Understand options payoffs, using those payoffs to find (i) bounds on options, (ii) the put call parity relationship, and (iii) interesting combinations of options, while understanding the motivation for investing in them.	• Midterm Test
CLO4 : Understand how to price call and put options using binomial trees, based on delta-hedging (no-arbitrage) arguments, and risk-neutral pricing.	• Midterm Test
CLO5 : Understand the Black-Scholes option pricing model, including some of the mathematics behind the model (such as Wiener processes and Ito's lemma).	• Final Exam
CLO6 : Understand how to price options on futures, options on stocks paying dividends and dividend yields, and options on currencies. We also discuss the early exercise of American call options on these assets.	• Final Exam
CLO7 : Understand and use the options Greek letters, which explain the price sensitivity of options to changes in underlying variables, such as the stock price, time, the risk-free rate, and volatility. Also, understand how the Greek letters help with hedging.	• Group Assignments • Final Exam
CLO8 : Understand how to extend the binomial model to price American options on futures, indices, and currencies, as well as calculating the Greek letters for American options using binomial trees.	• Group Assignments • Final Exam

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Learning and Teaching in this course

This course will be taught with a combination of lectures, additional reading materials, class discussions, internet resources and group work. It is expected that students will have a general interest in the area and will seek more specialized skills to apply the knowledge. The textbook provides a useful background to the topics and will be explored and discussed in class. A more in-depth group assignment will allow for the application of the concepts learned in class. This course provides the basis to analyze and solve a variety of problems related to derivative securities. The course consists of weekly three-hour lectures plus six hours of structured learning. The lecture notes will be available before class, so that students can have an overview of the topics in advance. During the lecture, we discuss the details of the lecture notes, and answer various questions that are left unanswered in the notes. We discuss the intuition behind results and regularly refer to the "big picture" issues, of how each topic relates to other topics. Questions and discussion in class are welcome. Practice problems will be made available as the

course progresses, and doing these should help students prepare for the exams as well as the assignment. The assessments will be based on the lecture notes and practice problems.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates	Program learning outcomes
Group Assignments Assessment Format: Group	25%	Start Date: See Detailed assessment description. Due Date: See Detailed assessment description.	• PLO3 : Business Communication • PLO4 : Teamwork • PLO5 : Responsible Business Practice • PLO6 : Global and Cultural Competence • PLO7 : Leadership Development
Midterm Test Assessment Format: Individual	35%	Start Date: See Detailed assessment description Due Date: See Detailed assessment description	• PLO1 : Business Knowledge • PLO2 : Problem Solving
Final Exam Assessment Format: Individual	40%	Start Date: See Detailed assessment description Due Date: See Detailed assessment description	• PLO1 : Business Knowledge • PLO2 : Problem Solving

Assessment Details

Group Assignments

Assessment Overview

The group assignments will ask students to perform some numerical exercises involving a number of risk management techniques. The assignment will heavily rely on EXCEL. Working knowledge of this software is required. It is a group assignment (groups of size up to 5). Students will choose their groups themselves.

Assesses: PLO3, PLO4, PLO5, PLO6, PLO7

Course Learning Outcomes

- CLO7 : Understand and use the options Greek letters, which explain the price sensitivity of options to changes in underlying variables, such as the stock price, time, the risk-free rate, and volatility. Also, understand how the Greek letters help with hedging.
- CLO8 : Understand how to extend the binomial model to price American options on futures, indices, and currencies, as well as calculating the Greek letters for American options using binomial trees.

Detailed Assessment Description

Weight	Assessment Name	Assessment Released Date	Assessment Due Date
10%	Group Assignment 1	week 2	week 4
15%	Group Assignment 2	week 8	week 10

Submission notes

Submission in Moodle course website

Assignment submission Turnitin type

Not Applicable

Midterm Test

Assessment Overview

A short quiz in week 4 will provide some early feedback on how students are progressing. If applicable, students should notify their employers of the requirement to attend exams. Failure to show up at the exams does not automatically lead to reassessment.

Assesses: PLO1, PLO2

Course Learning Outcomes

- CLO1 : Understand futures and forward contracts, using them for hedging, defining an optimal hedge ratio, and pricing them using no-arbitrage arguments.
- CLO2 : Understand currency swap contracts, the comparative advantage argument, and their pricing.
- CLO3 : Understand options payoffs, using those payoffs to find (i) bounds on options, (ii) the put call parity relationship, and (iii) interesting combinations of options, while understanding the motivation for investing in them.
- CLO4 : Understand how to price call and put options using binomial trees, based on delta-hedging (no-arbitrage) arguments, and risk-neutral pricing.

Detailed Assessment Description

Weight	Assessment Name	Assessment Date
35%	Mid-term Quiz (online)	week 6

Submission notes

Moodle online quiz

Assignment submission Turnitin type

Not Applicable

Final Exam

Assessment Overview

The exams will be a mix of multiple-choice, short answer questions and short essay questions.

Assesses: PLO1, PLO2

Course Learning Outcomes

- CLO5 : Understand the Black-Scholes option pricing model, including some of the mathematics behind the model (such as Wiener processes and Ito's lemma).
- CLO6 : Understand how to price options on futures, options on stocks paying dividends and dividend yields, and options on currencies. We also discuss the early exercise of American call options on these assets.
- CLO7 : Understand and use the options Greek letters, which explain the price sensitivity of options to changes in underlying variables, such as the stock price, time, the risk-free rate, and volatility. Also, understand how the Greek letters help with hedging.
- CLO8 : Understand how to extend the binomial model to price American options on futures, indices, and currencies, as well as calculating the Greek letters for American options using binomial trees.

Detailed Assessment Description

Weight	Assessment Name	Assessment Date
40%	FInal Exam	UNSW exam period to be defined

Submission notes

See Detailed assessment description

Assignment submission Turnitin type

Not Applicable

General Assessment Information

As a student at UNSW you are expected to display academic integrity in your work and interactions. Where a student breaches the UNSW Student Code with respect to academic integrity, the University may take disciplinary action under the Student Misconduct Procedure. To

assure academic integrity, you may be required to demonstrate reasoning, research and the process of constructing work submitted for assessment.

To assist you in understanding what academic integrity means, and how to ensure that you do comply with the UNSW Student Code, it is strongly recommended that you complete the Working with Academic Integrity module before submitting your first assessment task. It is a free, online self-paced Moodle module that should take about one hour to complete.

Grading Basis

Standard

Requirements to pass course

In order to pass this course students must:
- Achieve a composite mark of at least 50 out of 100
- Engage actively in course learning activities and attempt all assessment requirements
- Meet any additional requirements specified in the assessment details
- Meet the specified attendance requirements of the course (see Schedule section)

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Lecture	Fundamentals of Forwards and Futures Ch. 1 and 2; Ch. 3
Week 2 : 19 February - 25 February	Lecture	Pricing Futures Ch. 5 Group Assignment 1 Given
Week 3 : 26 February - 3 March	Lecture	Swaps Ch. 7 Sec. 7.8 and 7.9;
Week 4 : 4 March - 10 March	Lecture	Options I Ch. 10 and 11
Week 5 : 11 March - 17 March	Lecture	Binomial Models Ch. 12
Week 6 : 18 March - 24 March	Assessment	Mid-term Assessment
Week 7 : 25 March - 31 March	Lecture	Ito's Lemma & Black-Scholes & Options on Futures Ch. 13 and 14 Ch. 17
Week 8 : 1 April - 7 April	Lecture	The Greek Letters Ch. 18 Group Assignment 2 Given
Week 9 : 8 April - 14 April	Lecture	VaR Ch. 21
Week 10 : 15 April - 21 April	Lecture	Volatility Ch. 22

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Resources

Prescribed Resources

The website for this course can be found on UNSW Moodle.

Lecture Notes

The lecture notes, important announcements as well as additional reading materials will be available on UNSW Moodle. Practice questions with solutions for will also be made available on the course website. The assessments for this course are primarily based on the lecture notes and practice problems.

Prescribed textbook

- Options, Futures and Other Derivatives, by John C. Hull, 8th Ed., Prentice-Hall, 2011.

This textbook is widely used in courses and on the street. It includes almost everything you want to know about derivatives. It can be hard reading, but it is well worth the effort.

Course Evaluation and Development

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the myExperience survey, which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Li Yang					No	Yes

Other Useful Information

Academic Information

COURSE POLICIES AND SUPPORT

The Business School expects that you are familiar with the contents of this course outline and the UNSW and Business School learning expectations, rules, policies and support services as listed below:

- Program Learning Outcomes
- Academic Integrity and Plagiarism
- Student Responsibilities and Conduct
- Special Consideration
- Protocol for Viewing Final Exam Scripts
- Student Learning Support Services

Further information is provided on the key policies and support page.

Students may not circulate or post online any course materials such as handouts, exams, syllabi or similar resources from their courses without the written permission of their instructor.

STUDENT LEARNING OUTCOMES

The Course Learning Outcomes (CLOs) – under the Outcomes tab – are what you should be able to demonstrate by the end of this course, if you participate fully in learning activities and successfully complete the assessment items.

CLOs also contribute to your achievement of the Program Learning Outcomes (PLOs), which are developed across the duration of a program. PLOs are, in turn, directly linked to UNSW graduate capabilities. More information on Coursework PLOs is available on the key policies and support page. For PG Research PLOs, including MPDBS, please refer to the UNSW HDR Learning Outcomes.

Academic Honesty and Plagarism

As a student at UNSW you are expected to display academic integrity in your work and interactions. Where a student breaches the UNSW Student Code with respect to academic integrity, the University may take disciplinary action under the Student Misconduct Procedure. To assure academic integrity, you may be required to demonstrate reasoning, research and the process of constructing work submitted for assessment.

To assist you in understanding what academic integrity means, and how to ensure that you do comply with the UNSW Student Code, it is strongly recommended that you complete the Working with Academic Integrity module before submitting your first assessment task. It is a free, online self-paced Moodle module that should take about one hour to complete.

Submission of Assessment Tasks

SPECIAL CONSIDERATION

You can apply for special consideration when illness or other circumstances beyond your control interfere with your performance in a specific assessment task or tasks, including online exams. Students studying remotely who have exams scheduled between 10pm and 7am local time, are also able to apply for special consideration to sit a supplementary exam at a time outside of these hours.

Special consideration is primarily intended to provide you with an extra opportunity to demonstrate the level of performance of which you are capable. To apply, and for further information, see Special Consideration on the UNSW Current Students page.

Special consideration applications will be assessed centrally by the Case Review Team, who will update the online application with the outcome and add any relevant comments. The change to the status of the application immediately sends an email to the student and to the assessor with the outcome of the application.

Please note the following:

1. Applications can only be made through Online Services in myUNSW (see the UNSW Current Students page). Applications will not be accepted by teaching staff. The lecturer-in-charge/ course coordinator will be automatically notified when your application is processed.
2. Applying for special consideration does not automatically mean that you will be granted a supplementary exam or other concession.
3. If you experience illness or misadventure in the lead up to an exam or assessment, you must submit an application for special consideration, either prior to the examination taking place, or prior to the assessment submission deadline, except where illness or misadventure prevent you from doing so.
4. If your circumstances stop you from applying before your exam or assessment due date, you must apply within 3 working days of the assessment or the period covered by your supporting documentation.
5. Under the UNSW Fit To Sit/Submit rule, if you sit the exam/submit an assignment, you are declaring yourself well enough to do so and are cannot subsequently apply for special consideration.
6. If you become unwell on the day of – or during – an exam, you must stop working on your exam, advise your course coordinator or tutor and provide a medical certificate dated within 24 hours of the exam, with your special consideration application. For online exams, you must contact your course coordinator or tutor immediately via email, Moodle or chat and advise

them you are unwell and submit screenshots of your conversation along with your medical certificate and application.
7. Special consideration requests do not allow the awarding of additional marks to students.

Further information on Business School policy and procedure can be found under “Special Consideration” on the key policies and support page.

LATE SUBMISSION PENALTIES

For assessments other than examinations, late submission will incur a penalty of 5% per day or part thereof (including weekends) from the due date and time. An assessment will not be accepted after 5 days (120 hours) of the original deadline unless special consideration has been approved. An assignment is considered late if the requested format, such as hard copy or electronic copy, has not been submitted on time or where the ‘wrong’ assignment has been submitted.

For assessments which account for 10% or less of the overall course grade, and where answers are immediately discussed or debriefed, the LIC may stipulate a different penalty. Details of such late penalties will be available on the course Moodle page.

FEEDBACK ON YOUR ASSESSMENT TASK PERFORMANCE

Feedback on student performance from formative and summative assessment tasks will be provided to students in a timely manner. Assessment tasks completed within the teaching period of a course, other than a final assessment, will be assessed and students provided with feedback, with or without a provisional result, within 10 working days of submission, under normal circumstances. Feedback on continuous assessment tasks (e.g. laboratory and studio-based, workplace-based, weekly quizzes) will be provided prior to the midpoint of the course.

Faculty-specific Information

PROTOCOL FOR VIEWING FINAL EXAM SCRIPTS

UNSW students have the right to view their final exam scripts, subject to a small number of very specific exemptions. The UNSW Business School has set a protocol under which students may view their final exam script. Individual schools within the Faculty may also set up additional local processes for viewing final exam scripts, so it is important that you check with your School.

If you are completing courses from the following schools, please note the additional school-

specific information:

- Students in the **School of Accounting, Auditing & Taxation** who wish to view their final examination script should also refer to this page.
- Students in the **School of Banking & Finance** should also refer to this page.
- Students in the **School of Information Systems & Technology Management** should also refer to this page.

COURSE EVALUATION AND DEVELOPMENT

Feedback is regularly sought from students and continual improvements are made based on this feedback. At the end of this course, you will be asked to complete the myExperience survey, which provides a key source of student evaluative feedback. Your input into this quality enhancement process is extremely valuable in assisting us to meet the needs of our students and provide an effective and enriching learning experience. The results of all surveys are carefully considered and do lead to action towards enhancing educational quality.

QUALITY ASSURANCE

The Business School is actively monitoring student learning and quality of the student experience in all its programs. A random selection of completed assessment tasks may be used for quality assurance, such as to determine the extent to which program learning goals are being achieved. The information is required for accreditation purposes, and aggregated findings will be used to inform changes aimed at improving the quality of Business School programs. All material used for such processes will be treated as confidential.

TEACHING TIMES AND LOCATIONS

Please note that teaching times and locations are subject to change. Students are strongly advised to refer to the Class Timetable website for the most up-to-date teaching times and locations.