

UNIT OUTLINE: ACST828 OPTIONS, FUTURES AND DERIVATIVES

Unit Convenor: Tim Kyng

Pre-requisites: There are no specific pre-requisites, but see the section on assumed knowledge below

Co-requisites: none

Students in this unit should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult the teaching staff in the unit.

Assumed knowledge: Students are assumed to have strong mathematical skills, statistical and financial background knowledge and proficiency in spreadsheet programming as well as knowledge of the fundamentals of finance.

ABOUT THIS UNIT

This unit aims to provide students with a knowledge and understanding of the principles and techniques underlying the theory and practice in Derivative Markets. You will learn about different modeling techniques and will need to understand the usefulness and shortcomings of these techniques when applied in practice. It primarily aims to give you the tools for quantitative analysis of transactions and securities including valuation and risk management for capital projects and securities. This includes computer based numerical implementation using spreadsheet software.

The unit also aims to assist you to develop an ability to use the results derived from quantitative analysis along with judgement in the analysis of practical problems in the Financial Derivatives and Capital Markets area. In practice, the decision to invest in an investment project, a security, or a complex derivative will not be clear cut and it will always be necessary to make decisions based on competent analysis and an element of judgement.

This unit enables students to gain an understanding of the theoretical and practical skills necessary to understand financial derivatives.

TEACHING STAFF

Tim Kyng, Lecturer in Actuarial Studies, Room E4A 614, Ph: (02) 98507289, email tkyng@efs.mq.edu.au. Available for consultation on Fridays 10-11, 12-1 or at other times by appointment.

CLASSES

A 3 hour lecture / tutorial / computer laboratory on Saturdays from 10am – 1pm.

The details are:

Lectures: Saturday 10am-1pm E4B118

The timetable for classes can be found on the University web site at:

<http://www.timetables.mq.edu.au/>

REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

Prescribed textbooks: There are no prescribed textbooks. Lecture notes will be provided. The following books are highly recommended however.

Recommended reference texts and readings:

- Options Futures and Other Derivatives (6th Edition) by John Hull
- Solutions Manual to Options Futures and Other Derivatives (6th Edition) by John Hull

UNIT WEB PAGE

The web page for this unit can be found at: <http://online.mq.edu.au>

Consult the web page frequently. You will find administrative updates, lecture notes, tutorials and assignments posted there.

LEARNING OUTCOMES

On completing this unit, students will be able to demonstrate that they understand how to derive analytic formulae for European call and put options and some of the more straightforward exotic options, and how to write spreadsheet programs to do a numerical valuation of various option pricing problems.

In addition to the discipline-based learning objectives, all academic programs at Macquarie seek to develop students' generic skills in a range of areas. One of the aims of this unit is to develop problem solving and communication skills.

LEARNING AND TEACHING STRATEGY

The unit is taught by lectures, tutorials / computer laboratory sessions and assignments (individual, not group) engaging the topics taught.

Students are expected to read in advance; follow current developments in the market place; be able to apply the material covered in the teaching sessions to the major assignments; respond to questions raised during lectures / tutorials; demonstrate enthusiasm for the subject; challenge the lecturer's assumptions during lectures and explore opposing points of view.

A weekly table of topics will be provided later.

RELATIONSHIP BETWEEN ASSESSMENT AND LEARNING OUTCOMES

The objective of the assignments are to encourage students to learn by applying the material covered in the lectures and tutorials to a range of option pricing problems and scenarios, and demonstrating to the teacher they comprehend the concepts and techniques.

Assessment:

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|---------------------|-----|
| • Final Examination | 50% |
| • Assignments | 50% |

All students are required to pass the final examination AND make a serious attempt at the assignments to obtain a passing grade for the unit.

Assignments:

The assignments will include a range of different types of questions. These may require essay type answers, or derivation of mathematical formulae, or numerical calculations as appropriate. Details of the due dates will be announced during the term. Students will have 2 weeks to complete each assignment.

An ERIC INDIVIDUAL ASSIGNMENT COVER SHEET is required for all assignments, available for download from the ERIC website:

http://www.efs.mq.edu.au/docs/student_support/Individual_cover_sheet.pdf

Work that is submitted late may be penalised at the rate of 5 marks per day.

Examination:

The exam for ACST828 will be held in room E4B118 between 10am and 1pm on Saturday 15 November 2008. The exam will be open book and it will be held in a computer laboratory. Students may bring calculators, laptop computers, books and lecture notes along to the exam. Students may use the computers in the lab for any numerical calculations if they wish to. Exam duration: 2 hours and 30 minutes exam plus 10 minutes reading time.

Format of exam:

Questions may involve either essays, mathematical derivations or numerical calculations, or all of the above. Students may choose to answer any 4 of a choice of 6 questions on the exam. In addition there may be a take home component to the exam which must be completed and submitted within a week of the date of the exam.

STUDENT SUPPORT SERVICES

Besides the general services available, the Division of Economics and Financial Studies offers the following: ERIC: EFS Resource and Information Centre.

http://www.efs.mq.edu.au/student_support/eric

TOPICS COVERED

Topics

- Mathematical Background: review of calculus, probability / statistical theory and linear algebra
- Bonds and interest rates
- Forwards, Futures and Swaps
- Market efficiency and arbitrage
- Options - basic concepts and trading strategies
- Options - models for prices and returns.
- The discounted risk neutral expectations approach to derivative pricing, and the binomial and black-scholes approaches to the valuation of standard options
- Hedging and Portfolio Insurance
- Alternatives to Black Scholes
- General Approach to Valuation
- Numerical Procedures: binomial trees, finite difference methods & monte carlo simulation
- Exotic Options and valuation via analytic formulae and numerical methods
- Interest Rate Derivatives: valuation of standard contracts using standard valuation formulae
- Market Risk, Credit Risk and Capital Adequacy

IMPORTANT GENERAL REQUIREMENT FOR ALL UNITS

EXAMINATIONS:

The University Examination period in second semester is from 14/11/07 to 30/11/07. However, for Postgraduate Commerce units, the exams are usually held in the last week of semester, from 5/11/2007-9/11/2007.

You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of the examinations. <http://www.timetables.mq.edu.au/exam>

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration. Information about unavoidable disruption and the special consideration process is available at: <http://www.reg.mq.edu.au/Forms/APSCon.pdf>

If a Supplementary Examination is granted as a result of the Special Consideration process, the examination will be scheduled after the conclusion of the official examination period.

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is, the final day of the official examination period.

No aids, other than a pen and pencil, may be brought into an exam *unless specifically permitted by the Convenor*. The following are expressly forbidden: mobile phones, calculators, computers, I-pods, PDAs, MP3s and any other electronic aid, and books.

PLAGIARISM AND CHEATING:

The University defines plagiarism in its rules: "Plagiarism involves using the work of another person and presenting it as one's own." Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the *Handbook of Undergraduate Studies* or on the web at: <http://www.student.mq.edu.au/plagiarism/>

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Disciplinary Committee.

Plagiarism is simply a type of cheating. Any confirmed cheating may result in serious penalties, including deduction of marks, failure in the unit, and/or referral to the University Disciplinary Committee.

UNIVERSITY POLICY ON GRADING:

Academic Senate has a set of guidelines on the distribution of grades across the range from fail to high distinction. Your final result will include one of these grades plus a standardized numerical grade (SNG).

On occasion your raw mark for a unit (i.e., the total of your marks for each assessment item) may not be the same as the SNG which you receive. Under the senate guidelines, results may be scaled to ensure that there is a degree of comparability across the university, so that units with the same past performance of their students should achieve similar results.

It is important that you realise that the policy does not require that a minimum number of students are to be failed in any unit. In fact it does something like the opposite, in requiring examiners to explain their actions if more than 20% of students fail in a unit.

The process of scaling does not change the order of marks among students. A student who receives a higher raw mark will also receive a higher final scaled mark.

For an explanation of the policy see:

<http://www.mq.edu.au/senate/MQUonly/Issues/Guidelines2003.doc> or
<http://www.mq.edu.au/senate/MQUonly/Issues/detailedguidelines.doc>

The standard grading scheme is:

0 – 45	Fail
46 – 49	Pass Conceding*
50 – 64	Pass
65 – 74	Credit
75 – 84	Distinction
85 – 100	High Distinction

* when this subject is not a prerequisite for later units.

STUDENT SUPPORT SERVICES:

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at <http://www.student.mq.edu.au>

CLASSROOM ETIQUETTE

Students are expected to arrive on time, certainly before five minutes past the hour, and not to leave until the class ends. If you have a recurring problem that makes you late, or forces you to leave early, have the courtesy to discuss this with your lecturer/tutor.

Students are expected to be quiet during lectures unless, of course, class participation is required.

Mobiles should be turned off during classes; not simply set to “silent”.