

ECONOMICS OF DERIVATIVES
ECONOMICS EC9630A-001
Department of Economics
Western University

Fall 2019

General Information:

Instructor	Jorge Cruz Lopez
Office	SSC 4091
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Email	jcruzlop@uwo.ca
Course Website	https://owl.uwo.ca/portal
Office Hours	Tuesdays 5:30PM to 6:30PM and Wednesdays 4:00PM to 5:00PM
Term	Fall (September 9 to December 5, 2019)
Lecture Times	Mondays 3:30PM to 6:30PM
Lecture Location	SSC 3006
Final Exam Date	TBA
Final Exam Location	TBA
Prerequisites	ECON 9501, ECON 9505
Pre or corequisites	ECON 9536, FM9511
Program Inquiries	SSC Room 4076 or mfe@uwo.ca

Course Description/Overview:

This is an intermediate course on derivatives securities with a focus on practical applications. It is intended for graduate students who want to pursue careers in research, industry or government that focus on securities trading, risk management or asset pricing.

The course will begin with a review of asset pricing theory, arbitrage models, and pricing of plain vanilla derivatives such as futures, forwards, options and swaps, then it will focus on practical applications in trading, corporate finance, financial engineering and risk management.

While reviewing each topic the course will emphasize the effects of externalities, frictions, and modeling assumptions on valuations and trading strategies. The course will also highlight the role that financial institutions, market infrastructures and regulation play in enhancing welfare.

Learning Outcomes

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

1. Value “plain vanilla” and some sophisticated derivatives contracts.
2. Develop trading and hedging strategies in a variety of realistic scenarios.
3. Understand real option theory and its implications for investment decisions.
4. Understand the limits of pricing models and the effect of economic frictions on derivatives prices.
5. Understand the institutional and regulatory environment governing derivatives markets.

Method of Instruction

There will be one three-hour lecture per week. Lectures will consist of a combination of presentations and class discussions. Students will be required to work in groups for their assignments. Assignments will include case studies, problem sets and replications of academic papers. Students will also be required to write a final report and deliver a group presentation during the semester. Students are encouraged to pursue projects that are compatible with their desired careers in either research, industry or government.

In addition to the graded components of the course readings and practice problems will be assigned regularly. This material can be found in the course website, online or in the University Library. Students are responsible for reviewing assigned reading material and practice problems prior to each lecture.

Lectures are expected to be interactive and active participation is strongly encouraged and graded. **During lectures, the instructor will randomly select students to present a brief summary of the assigned readings or practice problems. Students will be assigned participation marks based on the quality of their summaries and class discussions.**

Please note that due to time constraints, not all assigned reading materials will be covered in class. However, students are still responsible for studying these materials as they will be included in the graded components of the course (i.e., assignments and exams).

Required Textbooks

Selected readings and problems might will be assigned from the following references:

[Chance, D. M. and Peterson, P. P. \(2002\), Real Options and Investment Valuation. The Research Foundation of AIMR.](#)

Cvitanic, J. and Zapatero, F. (2004). Introduction to the Economics and Mathematics of Financial Markets, First Edition, The MIT Press.

Kosowski, R. and Neftci, S. (2014). Principles of Financial Engineering. Third Edition, Academic Press.

Hull, J. (2017). Options, Futures, and Other Derivatives, Tenth Edition, Pearson.

Note: Additional readings from academic papers, practitioner publications and other textbooks might be assigned during the semester.

Suggested Textbooks

Students might also want to consider using the following books to support their learning for this course and for future reference:

Brigo, D., Morini, M., Pallavicini, A. (2013). Counterparty Credit Risk, Collateral and Funding: With Pricing Cases for All Asset Classes, First Edition, Wiley.

Campbell, J. (2017). Financial Decisions and Markets: A Course in Asset Pricing, First Edition, Princeton University Press.

Crouhy, M., Galai, D. and Mark, R. (2014). The Essentials of Risk Management, Second Edition, McGraw-Hill.

Cox, J. and Rubinstein, M. (1985). Options Markets, First Edition, Pearson.

Dixit and R. Pindyck, (1994). Investment under Uncertainty, First Edition, Princeton University Press.

Duffie, D. (2001). Dynamic Asset Pricing Theory, Third Edition, Princeton University Press.

Forsyth P. (2017). An Introduction to Computational Finance Without Agonizing Pain, Available at <https://cs.uwaterloo.ca/~paforsyt/agon.pdf>

Gregory, J. (2014). Central Counterparties: Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives, First Edition, Wiley.

Hull, J., (2018). Risk Management and Financial Institutions, Fifth Edition, Wiley.

Poitras, Geoffrey (2006). Risk Management, Speculation, and Derivative Securities, First Edition, Academic Press.

Roman, S. (2014). Introduction to the Mathematics of Finance: Arbitrage and Option Pricing, Second Edition, Springer.

Schwartz, Eduardo and Lenos Trigeorgis (2001) Real options and investment under uncertainty: classical readings and recent contributions, First Edition, MIT press

Trigeorgis, L. (1996), Real Options: Managerial Flexibility and Strategy in Resource Allocation, First Edition, The MIT Press.

Additional Material

Lecture notes, practice problems, assignments and other supplemental material will be available through the course website. Additional readings (e.g., book chapters, academic articles, etc.) will be available through the course website or the University Library.

Materials available for download from the course website will be available in HTML, PDF, PowerPoint, Word or Excel format. Therefore, students should have access to computers that have the appropriate software packages loaded.

Office Hours

Students having difficulty understanding the course material, are strongly encouraged to attend office hours. It is in the best interest of students to clarify any questions that they might have regarding the course material as soon as they do not understand something. Most of the topics covered in this course require a clear understanding of concepts previously covered in class and in prerequisite and corequisite courses.

During office hours, the instructor will try to explain the concepts that need clarification. **For questions involving assignments, students are required to show that they have made a considerable effort trying to solve the assigned problems before the instructor can provide any assistance. The instructor will not give the answers to any of the problems in the assignments prior to their due date.**

Communications

Students should use email for communicating with the instructor outside of lectures and office hours. Questions that require typing equations or the explanation of complex concepts should be asked during office hours and will not be answered by email.

Emails will be answered within 24 hours during weekdays only. Emails sent on Fridays or during the weekend will be answered the following Monday.

All emails must be sent from valid Western University accounts. The subject should include the course code and number (ECON9630) and the email's signature should include the student's full name and student ID. Emails from third party accounts will be disregarded.

Grading

Participation	5%
Assignments (2 Problem Sets and 1 Case Study)	30%
Final Report and Presentation	15%
Midterm Exam	20%
Final Exam	30%
Total	100%

Participation

Work type:

- Individual

Context:

- Students are expected to actively contribute to class discussions. During each lecture, the instructor will randomly select a few students to present a brief summary of the assigned readings and problems for that lecture.
- In addition, we will have an optional **Trading Simulation Competition (TSC)**. Students can join the competition and accumulate marks by placing and properly documenting their trades. Additional instructions regarding the TSC will be provided during the first lecture.

Evaluation:

- Students will be evaluated based on the quality of their contributions to class discussions, as well as on their demonstrated ability to summarize, explain and apply the concepts covered in the assigned readings.

Assignments (2 Problem Sets and 1 Case Study)

Work type:

- Groups (minimum 2 students, maximum 3 students)

Context:

- The assignments consist of two problem sets and one case study that should be **solved in groups**. Students can select their own groups, but they should remain the same group throughout the course.
- **Students are required to submit a hard copy AND an electronic copy of their assignments.** Hard copies should be submitted in class (one document per group). Electronic copies should be uploaded as a single file (preferably in PDF format) to the course website. Acceptable electronic formats for assignments are MS Word, MS Excel, and PDF. No other formats will be accepted. Students should always keep a hard copy of their assignments for their own records.
- **Assignments must be typed and include the *Group Assignment Grading Sheet* provided in the course website.** Equations and some calculations may be handwritten but the writing must be clear and legible. No marks will be given for work that is difficult to read or understand.

- **All assignments (both hard and electronic copies) must be submitted by the beginning of the session when they are due.** Students should check the course website to know when a new assignment has been posted and when it is due.
- **Assignments submitted by email will not be accepted.**
- Students are expected to know how to use MS Excel and be familiar with at least one of the following programs: R, Python or Matlab. These programs will be required for completing assignments and other graded components of this course.

Evaluation:

- Each group will be graded based on the **accuracy and style** of its assignments. In addition, each group member will be evaluated based on the student's individual contribution as assessed by other group members.
- Except for documented medical reasons, **late assignments will not be accepted and will receive a grade of zero.**
- Graded assignments will be returned to students within two weeks of their submission.

Final Report and Presentation

Work type:

- Groups (minimum 2 students, maximum 3 students)
- Same groups as for assignments

Context:

- Students are required to work on a practical case study or replicate an academic paper.
- Students are encouraged to select topics that align with their career objectives. They should take this opportunity to build a portfolio of concrete examples that showcases their skills.
- The instructor will provide additional information during the lecture on how to select a topic and either a case study or academic paper.
- Topics, case studies and papers need to be approved by the instructor.

Evaluation:

- Each team will be required to submit a report with the analysis of a case study or the replication of an academic paper.
- Each team will be required to deliver a short presentation based on the written report.
- All students in the group are required to present.
- Students will be evaluated on the accuracy of their analysis and their presentation skills.

Exams

Work type:

- Individual

Context:

- Students are required to write **a midterm and a final exam**.
- The midterm and the final exams are **closed-book and closed-notes, in-class exams**.
- The midterm exam will last 100 minutes. The final exam will last 150 minutes. Students should check the course website and the university exam schedule to confirm the date and time of the final exam.
- Both **exams are cumulative** and will cover all the material assigned up to the date of the exam (i.e., class notes, assignments, practice problems and required readings).
- Students can only use the following materials during exams:
 - Pens and pencils
 - Non-programmable calculators
 - One formula sheet
- These materials cannot be shared among students during the exams.
- The **formula sheet** for the midterm exam should not exceed one single-sided page. The formula sheet for the final exam should not exceed one double-sided page. **In both cases, a page refers to a letter size page (215.9 × 279.4 millimeters or 8.50 × 11.00 inches).**

Evaluation:

- Each exam will be graded out of 100 marks. Grades will be uploaded in the course website within two weeks of the exam date.

Appealing a Grade

Assignments:

- If students disagree with the grade obtained in an assignment, they should submit their grievance in writing documenting the merits of their case within a week of receiving the graded assignment. No claims will be accepted after one week.

Exams:

- If students disagree with the grade obtained in the midterm exam, they should submit their grievance in writing during the lecture when the graded exam is handed back. No claims will be accepted after this period.

Missing a Deadline or Exam

Assignments, Final Report and Presentation:

- Missing a deadline will result in obtaining a grade of zero in the corresponding course component. If students are in a situation where they cannot meet a deadline, they should contact the instructor before the deadline expires to discuss a possible extension. Extensions are only granted in very special circumstances.

Midterm Exam:

- Students unable to write an examination because of illness or other circumstances beyond their control must contact the instructor in writing as soon as possible explaining the situation in accordance to university rules. If students miss the midterm exam and support their absence with a medical certificate, the weight of the midterm exam will be transferred to the final exam in accordance to university regulations. In these cases, the final exam may be longer than that given to other students who did not miss the midterm exam in order to conduct a comprehensive assessment of the course material.
- Missing the midterm exam without a documented justification in accordance to university rules, will result in a grade of zero for that component of the course.

Midterm Exam:

- Final exam deferrals may be granted when the absence is supported by a medical certificate or appropriate documentation that justifies a deferral. Deferred exams are not granted for students who have made travel arrangements that conflict with the examination schedule. For additional information please consult the university's course evaluation policies.

Important Notes

Changes to Course Outline:

- **Every effort has been taken to make the information in this document as complete and as consistent as possible. However, the instructor reserves the right to modify the course outline or required material at his discretion.** If changes to this document are made, the instructor will communicate these changes to students registered in the course by email and an updated version of the outline will be distributed either by email or through the course website.

Copyright:

- Lectures and course materials, including power point presentations, outlines, and similar materials, are **protected by copyright**. Students may take notes and make copies of course materials for their own educational purposes. **However, students may not record lectures, reproduce (or allow others to reproduce), post or distribute lecture notes, wiki material, and other course materials publicly and/or for commercial purposes without written consent of the professor or authors.**

Course Schedule and Readings (Tentative and Subject to Change)*

Week	Dates	Topics	Readings	Comments
1	Sept 9	Introduction and Review of Interest Rates, Forwards, Futures, Swaps and Options.	H: 4, 5, 7, 10, 11, 12. CZ: 1.3 - 1.5, 2 KN: 1 - 4	
2	Sept 16	Review Continued	H: 4, 5, 7, 10, 11, 12. CZ: 1.3 - 1.5, 2 KN: 1 - 4	
3	Sept 23	Pricing Models	H: 13, 14, 15 CZ: 3, 6, 7, 8 KN: 8, 12, 13	Review CZ: 5 Due: PS 1
4	Sept 30	Pricing Models	H: 13, 14, 15 CZ: 3, 6, 7, 8 KN: 8, 9.1 - 9.5, 12, 13	Review KN: 6,7
5	Oct 7	Hedging and Risk Management	H: 19, 20 CZ: 9 KN: 5, 9.6 - 9.7, 14	Review H: 3, 6, 21 CZ: 11 Due: PS 2
6	Oct 14	Thanksgiving: Classes are suspended.		
7	Oct 21	Midterm Exam		Midterm: Includes all material covered up to Week 7
8	Oct 28	Applications: Real Options and Project Evaluation	H: 36 CP/CFA Book	
9	Nov 4	Fall Reading Week: Classes are suspended.		
10	Nov 11	Applications: Credit, FX, Insurance and Commodities	H: 24 - 26, 34, 35 KN: 18, 19, 21, 23	
11	Nov 18	Selected Topics: FMI's and Regulation	H: 8, 9, 24, 37 KN: 24	Due: Case Study
12	Nov 25	Student Presentations Selected Topic 3: [Depending on Class Interests]	Depend on selected topic	
13	Dec 2	Student Presentations Review		Due: Final Report
-	TBA	FINAL EXAM		Final: Includes all material covered in the course

* See course website for additional readings and changes

Department Policies

Policy on Academic Offences:

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Statement on Accessibility Services

Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate Students with Disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are encouraged to register with Student Accessibility Services, a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both SAS and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

For more information, see <http://www.sdc.uwo.ca/ssd/>

Statement on Mental Health and Support Services

Students under emotional/mental distress should visit http://uwo.ca/health/mental_wellbeing/ for more information and a complete list of resources on how to obtain help.