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| **Title** | **Derivatives**  |
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| **Lecturer** | **Dimitris Andriosopoulos** | Tutor | TBC |
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|  | Code | AG929 | Semester | 2 | Weeks | 1 – 6 | Credits | 10 |  |
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|  | **Assessment** |  | Examination | 70% |  | Coursework |  30% Simulation Assessment |  | Test |  |  |
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|  | Finance | N/A |  | Int. Banking & Fin. | N/A |  | Investment & Fin. | N/A |  | Int. Accounting & Fin. | N/A |  | Economics & Fin. | Option |  |
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## CLASS AIMS

The aims of this class are to provide a strong grounding in derivatives that may be used to manage the financial risks faced by individuals, financial institutions and business corporations.

In particular, the class will examine futures and forward contracts, options, swaps and credit derivatives, and how these may be used for speculation, hedging, and arbitrage purposes. The emphasis is on understanding the pricing of these derivatives and the strategies devised to hedge long and short positions in underlying assets such as equities, bonds, and interest rates. The role of derivatives in the global financial market is also covered, including a discussion of the difficulties due to the regulatory framework of derivatives and the (partial) lack of regulation of derivatives. Emphasis is placed on practical techniques and the solution of problems, though not to the exclusion of theory. It will develop students’ understanding of international finance and capital markets, foreign exchange risk management and derivatives.

Derivatives and risk management are important growth areas in finance. This class will introduce students to these topics and will provide a good basis studying for professional examinations in the area. Related to this the class provides access to a derivatives trading simulation platform and will also provide an introduction to international finance and a number of issues facing a multinational business operating in international capital markets. Finally, this class will provide a good insight on the benefits but also risks involved with the use of derivatives and how a mismanagement of the use of derivatives can lead to severe losses and spill-over risks as experienced during the financial crisis of 2007-09.

## LEARNING OUTCOMES

The class provides opportunities for students to develop and demonstrate knowledge, understanding and skills in the following areas:

**i) Knowledge Based Outcomes:**

 On completing this course students will be able to:

* understand the basic principles of derivatives, in particular futures and forward contracts, swaps and options; and the trading mechanisms for these derivative securities;
* distinguish clearly between speculation, arbitrage, and hedging motives
* understand the strategic use of derivatives in various combinations, hedging strategies, and the pricing of derivatives
* use appropriate models for the valuation of derivative securities;
* use current derivatives data from live sources such as CME and ICE
* understand the current framework on derivatives’ regulations
* demonstrate an awareness of the biases in conventional pricing models, and how these may be overcome in practice
* show an awareness of the role of derivatives in the global financial crises from 2007 onwards
* identify the financial risks facing large multinational companies; and
* analyse the hedging instruments and assess their suitability in relation to the risks identified.

**ii) Skills Outcomes:**

 On completion of this class students should be able to demonstrate that they can:

* Interpret and evaluate financial problems posed both in quantitative and non-quantitative terms.
* Solve practical risk management problems using a case study approach.
* Connect academic theories to the practice of risk management
* Undertake team work and enhance communication skills developed in the assignment project
* Use information technology in use of the class web-sites and links, literature review, word-processing and spreadsheet skills in workshop preparation and in assessed projects.
* Understand the language and jargon related to risk management and derivatives.
* Assess the benefits and shortcomings of varying pricing and hedging methodologies by reading professional derivatives and finance journals.

**TEACHING AND LEARNING**

Students will be introduced to the main themes and topics in the lectures. These are reinforced, extended and developed through the discussion of prepared questions in workshops - these questions are to check an understanding of the lecture content and ability to explain the key concepts involved. Active participation in workshops is important and this will be encouraged by tutors to the extent of occasionally requiring short presentations by students. . Students will have access and will be strongly encouraged to apply their knowledge on the derivatives trading simulation that will be provided alongside the class. At all times students are expected to supplement their learning by reading the prescribed textbook(s) and be with the most up to date developments via newspapers or web articles along with material uploaded on my place.

**ASSESSMENT**

Assessment is based on a class examination and a simulation assessment. The exam will count for 70% of the final mark and the simulation assessment will account for 30% of the final mark. The final examination will take place in the April/May diet of examinations and will be of three hours duration. Any reassessment will be via a re-sit exam of the same format as the main exam. If a candidate does not pass the course at the first attempt, or cannot sit the exam for medical or personal reasons, they will be required to take the re-sit examination.

**READING**

***Recommended****:*

J. C. Hull. “Options, Futures and Other Derivatives”. Pearson 9th Ed., 2017, ISBN13: 9781292212890. (previous editions are acceptable)

***Alternative****:*

Don M. Chance and Robert Brooks “Introduction to Derivatives and Risk Management, Cengage 10th Edition, 2016, ISBN13: 9781305104969.

Rangarajan K. Sundaram and Sanjiv R. Das, “Derivatives. Principles and Practice.” MacGraw Hill 2nd Ed, 2015, ISBN13: 9781259010873.

## LECTURE PROGRAMME

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| **Derivatives – Prof Dimitris Andriosopoulos** |
| **Week** | **Lecture / Tutorial**  | **Subject/Content** |
| **1** | Lecture1 | L1. A: General background on derivatives and module information. Characteristics of futures and forward contracts. Traded contracts and contracts on over-the-counter (OTC) markets. L1. B: Characteristics of Options - calls and puts, intrinsic value and time value. L1. C: American and European options. Payoffs at expiration using examples of exchange traded options.  |
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| **2** | Lecture2 | L2. A: Options strategies, financial engineering, synthetics and combinations (e.g. straddles, spreads, butterflies).L2. B: Put-Call parity L2. C: Binary options pricing modelL2. D: The Black-Scholes-Merton (BSM) pricing model and how it is used in practice.  |
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| Tutorial 1 | Tutorial 1 covering curriculum of previous week |
| **3** | Lecture3 | L3. A. Option delta and the hedge ratio, Option elasticity.L3. B: Overview of the Greek Letters. Risk management based on the Greek letters.L3. C: Futures trading and margin accounts. Stock futures and index futures. L3. D: Motives for trading in futures: speculation, arbitrage, and hedging. Hedge ratio. Perfect and imperfect hedges. |
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| Tutorial 2 | Tutorial 2 covering curriculum of previous week |
| **4** | Lecture4 | L4. A: Pricing of futures, the spot-futures parity theorem, futures prices examples from LIFFE. Mispricing and arbitrage. L4. B: Pricing of forward contracts. Comparison of futures and forward contracts.L4. C: Futures and LIBOR |
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| Tutorial 3 | Tutorial 3 covering curriculum of previous week |
| **5** | Lecture 5 | L5. A: Short term interest rate futures (STIRs). Eurodollar contracts. Hedging with STIRs. Long term interest rate futures – bond derivatives. L5. B: Interest rate swaps - how they work and how to value |
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| Tutorial 4 | Tutorial 4 covering curriculum of previous week |
| **6** | Tutorial 5 | Tutorial 5 covering curriculum of previous week |