advantere School of Management

TEACHING GUIDE

Course Information	
Full Name	**Derivatives**
Code	0000012208
Full Name	Masters Degree in Finance
Level	Postgraduate Official Master´s Degree
Quarter	1
Credits	3,0 ECTS
Type	Mandatory
Person in charge	Luba Schoenig / Mikel Larreina
Office hours	Continuous availability via email

Professor Information	
Professor	
Name	Luba Schoenig
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Professor	
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SPECIFIC COURSE INFORMATION

Course contextualization

Contribution to the professional profile of the degree

This course covers one of the most interesting and important areas of finance: derivatives. Financial derivatives such as forwards, futures, swaps and options allow a risk manager to mitigate or even eliminate undesirable risks faced either at the corporate level or at the portfolio management level. For example, an airline's risk manager may enter into a future crude oil contract to hedge against future increases in jet fuel, or a bank may use credit default swaps to hedge a customer's credit risk. Interest rate and currency swaps give a company a lot of flexibility in choosing to finance a project with debt. On the other hand, an active portfolio manager may use a put option on the S&P500 to hedge against market corrections. Financial derivatives allow investors to trade on the future price of assets using minimal initial investments, making financial markets more liquid and efficient. For example, active traders in equity indices and FX futures markets can often leverage their positions 25-50x respectively depending on the volatility of the underlyings. This leverage built into derivatives is often poorly understood and is the source of many highly volatile derivatives transactions (Lehman Brothers, LTCM, Amaranth, Barings Bank...).

In short, individuals and institutions use derivatives to fulfill a variety of purposes. Companies and portfolio managers may use derivatives to hedge certain types of risks or alter the distribution of returns on their portfolios in certain ways, but some institutions and private investors may use derivatives to speculate. There is an extensive literature on the valuation of derivatives. At first, the theory may seem advanced and difficult, but it is actually quite accessible. The objective of the course is to provide the student with the necessary skills to value and use derivative instruments in a useful way. To provide a useful treatment of these topics in a rapidly changing environment, it is necessary to emphasize the fundamentals and explore the topics at a technical level. However, the course places its main emphasis on the practice with derivatives, since, in this way, the student progressively acquires the fundamental technical notions and experiences the real use of said instruments in real environments. For example, the student will be able to understand the difference between the theory of options and futures and the real situations that traders in the capital markets face on a day-to-day basis. To make the experience more real, students will do internships with Bloomberg in which they will build their own strategies with spot, options and futures, valuing different instruments both theoretically and practically.

Competences – Objectives

Competences

GENERAL		
CG.10	Technical Capacity: Capacity for analysis, synthesis, and projection, applied to situations, problems, and models, in the financial field.	
	RA1	It is capable of dealing with the analytical study of cases and scenarios, as well as carrying out information and data synthesis.
SPECIFIC		
CE 04	Master the different valuation and modeling techniques of derivative assets and contextualize them within the advanced management of real investment portfolios.	
	RA1	Understands both the role of derivative products both in arbitrage situations and in the total or partial coverage of financial risks or investment

		speculative activity in the various organized and unorganized financial markets in which they are traded, understanding the role played by both leverage and credit risk in the transaction of these products.
	RA2	It is able to define, build and program valuation models for derivative products of interest rates, equities, currencies or raw materials using financial mathematics and probabilistic calculation.

THEMES AND CONTENT

Contents-Themes
Lesson 1: The World of Derivatives
1. What is a derivative? 2. A brief history of derivatives.
Lesson 2: Basic concepts
1. What is the spot? 2. What is a futures contract? Liquidation and Margins. Basic trade. 3. What is a term contract. Non-arbitrage principle. 4. Forward and future pricing: • Bonuses • Stocks and indices. • Foreign exchange.
Lesson 3: Types of derivatives
1. Options Calls and Puts. 2. Calls & Puts in a trader's day. 3. Long and short positions. 4. Long and short positions in a trader's day 5. Put-call parity. Why is put-call parity important to a day trader? 6. Swaps. Swap types. Which Swaps are mainly used in practice
Lesson 4: Key parameters to determine the value of a derivative.
1. Spot price. The Delta. The Gamma. Hedging of the underlying risk in a trader's day. 2. Volatility theory. The Vega. The "Smile curve" of volatility. Volatility term structure. Managing volatility in a trader's day. 3. Dividend. Dividend yield in theory. Managing Dividend Risk in a Trader's Day. 4. Interest rate. the rho 5. The Time. theta. Managing the risk of deterioration of time in a trader's day.
Lesson 5: Strategies with Options.

1. Bullish strategies with options.
    a. Bull call spreads
    b. Bull put spreads
    c. Synthetic call
2. Bearish Options Strategies
    d. Bear call spreads
    e. Bear put spreads
    f. Synthetic put
3. Neutral Strategies
    g. straddles
    h. Strangles

Lesson 6: Valuation models.

1. Binomial model (method and limitations)
2. Wiener Processes and Ito's Lemma
3. Black & Scholes (method and limitations)
4. Which models are mainly used in practice?

Lesson 7: Portfolio management in practice.

1. What is a benchmark?
2. What is the alpha of a portfolio?
3. What is the beta of a portfolio?
4. Types of portfolio risks
5. Cover the delta of a portfolio
    a. Short selling stocks/futures
    b. Long puts
    c. Put spread
    d. Necklace and Covered calls
6. Hedging the dividend risk of a portfolio
7. Hedging the correlation risk of a portfolio
8. Hedging the gap risk of a portfolio
9. Transaction costs and liquidity limitations
10. Key aspects to consider in the day to day of a trader.

SUMMARY OF STUDENT WORK HOURS

PRESENTIAL HOURS					
Professor Exposition	Student exhibition. Debates and group dynamics	Exercises and problem solving. Elaboration of applied work	Analysis and documentation	Tutorial sessions	Development of real projects for organizations
7	9	12	0	1	1
NON-PRESENTIAL HOURS					
Professor Exposition	Student exhibition. Debates and group dynamics	Exercises and problem solving. Elaboration of applied work	Analysis and documentation	Tutorial sessions	Development of real projects for organizations
0	0	35	23	1	1
ECTS CREDITS: 3,0 (90,00 hours)					

TEACHING METHODOLOGY

General methodological course aspects

Presential Methodology: Activities

The face-to-face training methodology is active-participatory and demonstrative-explanatory. The professor will be the facilitator and guide of the training action, using the necessary didactic means to transmit the theoretical concepts and the corresponding practice for the assimilation of the contents for each unit. The participation of students in classes and their active involvement in the proposed activities will be sought at all times through the professor's presentation of theoretical and practical cases, student presentations, debates and group dynamics with resolution of exercises and problems. individually and in groups. The face-to-face sessions will be structured following guidelines of dynamism, cooperative learning and interaction to favor the learning of concepts and achieve the defined objectives-capabilities. To this aspect we must add the eminently practical component, with simulations and role-playing that will contextualize and prepare it
for application in the workplace.

Non-presential Methodology: Activities

The non-attendance methodology will be based on the study, personal research reading of texts of different types (cases, books, magazines, articles, press, Internet publications, reports on practical experiences, etc.) related to the study courses, as well as such as discussion and collaborative work with other members of the group on various tasks.

EVALUATION AND GRADING CRITERIA

Graded Activities	Evaluation Criteria	% of Total Grade
Evaluation of the individual or collective works carried out by the students, some of them presented in class.	Adequacy of the work to the objectives set Delivery on time Adaptation and orientation to the objectives. Results achieved. Deadlines. The participation of ALL the members of each team in the presentations and elaborations is necessary.	50
Carrying out oral and written exams, public defenses and multiple choice tests, concept tests and resolution of practical cases as an exam	At the end of the program an exam will be held. In order to pass the course, the minimum result of the exam must be 5 as a necessary condition to pass the course.	30
Participation and utilization of the classes	When we talk about participation, it is clear that both the positive and negative ones are counted and that the quality of participation is as important as the quantity. The students' participation in class, the quality and timeliness of their interventions, the quality in the preparation and presentation of their work, predisposition and commitment, initiative, attendance.	20

Grades

Notes to the evaluation criteria:

1. All students must comply with 100% attendance on the days established for this course. Any absence must be justified.
2. The final grade corresponds to the sum of the graded activities, the evaluation criteria and the % of the total grade described in the Evaluation and Grading Criteria section.
3. Individual and group work must be submitted on time and in the form specified by the subject`s teacher.
4. A final grade lower than 5 implies the need to take an extraordinary exam. The final grade for this exam may not exceed the median of the passing grades at the time of the schedule exams.

The evaluation criteria for enrolling in a second year:

The student enrolled in the second-year course mut fulfill the individual and group tasks established by the course professor. The same evaluation criteria described in the Evaluation and Grading Criteria section will be maintained.

In circumstances not covered by this Teaching Guide, the Advantere School of Management Regulation and the General Regulation of Comillas will apply.

Health alert criteria:

The student must be permanently identified, in class with an identification poster and remotely with their full name. Students should not change the spaces they occupy in the classroom, until indicated by a professor or the direction of the program.

Failure to comply with any of the health recommendations during the teaching sessions may lead to failure in the course.

BIBLIOGRAPHIES AND RESOURCES

Basic Bibliographies

1. Options, Futures, and Other Derivatives, John C. Hull, 11th edition, 2021
2. The Mathematics of Derivatives, Robert L. Navin, 1st edition, 2006
3. Trading Options Greeks, How Time, Volatility, and Other Pricing Factors Drive Profits Dan Passarelli, 2nd edition, 2012
4. Financial Derivatives, Robert W. Kolb, James A. Overdahl, 2014
5. Binomial Models in Finance, Van Der Hoek, John; Elliott, Robert J., 2006
6. Investment and Portfolio Management, A Practical Introduction, Ian Pagdin, Michelle Hardy, 2017
7. Pioneering Portfolio Management, An Unconventional Approach to Institutional Investment, Fully Revised and Updated, David F. Swensen, 2009
8. Modern Portfolio Management, Active Long/Short 130/30 Equity Strategies, Martin L. Leibowitz, Simon Emrich, Anthony Bova, 2008.
9. When Genius Failed: The Rise and Fall of Long-Term Capital Management, Roger Lowenstein, 2000.

Web and technology resources

Bloomberg

Eikon

www.bis.org

www.esma.europa.eu

www.cftc.gov

www.cnmv.es

www.euronext.com

www.meff.es

www.theice.com