Máster Universitario en Finanzas y Banca/ Master of Science in Finance and Banking

1. SUBJECT

- **Name:** Investments Trends, Quantitative Strategies and Machine Learning
- **Type of subject:**   elective
- **Credits:** 4 ECTS
- **Hours dedication:** 24 hours (in classroom)
                                        76 hours (out classroom)
- **Coordinator of the subject:** Albert Banal-Estanol
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- **Professor**: José Suarez-Lledó
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2. COURSE DESCRIPTION

Contents

This part will provide an overview of the risks affecting the outcome of financial investments (market risk, interest rate risk, liquidity risk, operational risk and off-balance sheet risk) and describe the derivative products that allow them to be hedged in organised and over-the-counter markets. With the imminent emergence of 5G and quantum computing, improved algorithms in data and big data science, artificial intelligence and machine learning, it is important to analyze how new financial technologies will affect financial markets. The course introduces students to the main fintech tools for investment management, such as Machine Learning, Neural Network and the Robo Advisors. An overview of the algorithmic and high frequency trading will also be provided, including the various types of execution and trading algorithms, as well as an overview of the effect of market fragmentation on how trades intersect. We will also discuss the use of technology in risk management and the effects on regulatory oversight, and issues and concerns related to the impact of algorithmic and high frequency trading on the securities markets.
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Specific Abilities
SA1. Analyse the impact of the accounting framework, macroeconomics and international finance on the management of the company, studying the current and expected context, in order to maximise the value of the company.

SA2. To understand the functioning of financial institutions, as well as the impact of banking regulation on them.

SA3. Apply financial tools to estimate the value of financial products, real assets, and firms, using qualitative, econometric and statistical techniques.

SA4. Apply management techniques in commercial banks and other deposit-taking institutions necessary to grant or not to grant a bank credit to a company.

SA5. Demonstrate an understanding of the interaction between financial products and institutions and real assets and firms.

SA6. Identify the possibilities of the digital economy for understanding customer needs and expectations.

SA7. Determine knowledge of the new computer technologies of artificial intelligence and machine learning and their possibilities in the digital economy.

SA8. To be able to draw conclusions in order to contribute some new aspects to the field of knowledge.

Teaching methodology

TM1 **Traditional methodologies**: this includes lectures based on the lecturer's explanations.
TM2 **Active methodologies:** this includes discussion sessions on previously assigned reading; presentations of topics by students.
TM3 **Independent methodologies:** this includes reading texts and carrying out individual or group assignments.

Evaluation criteria

Evaluation	Minimum	Maximum
Exam	40%	70%
Presentations	10%	30%
Individual our group project	20%	40%
Participation in the activities planned within the classroom	10%	30%
Total	**80%**	**170%**

3. BIBLIOGRAPHY

- Berk and P. DeMarzo; Corporate Finance, Pearson (Ch. 1, 2, 3)
- Brealey, R. A., Myers, S. C., and Allen, F.; Principles of Corporate Finance, McGraw-Hill(Ch. 1, 2, 3)
- Grinblatt and S. Titman; Financial Markets and Corporate Strategy, McGraw-Hill (Ch. 1,2, 3)
- Cochrane, J.; Asset Pricing, Princeton University Press (Ch. 1, 2, 3, 4)
- oFabozzi, Focardi, Rachev, and Arshanapalli; The Basics of Financial Econometrics, Wiley
- Ilmanen; Expected Returns, Wiley
- Fabozzi and Markowitz; The Theory and Practice of Investment Mangement, Wiley (Ch.2, 3, 4)
- Ang, A.; Asset Management: a Systemic Approach to Factor Investing, Oxford (Ch. 2, 3,4)
- Meucci, A.; Risk and Asset Allocation, Springer Finance (Ch. 3, 4, 5)
- Litterman and the Quantitative Resources Group; Modern Investment Management: andequilibrium approach, Wiley Finance (Ch. 3, 4)
- Tutuncu and Cornuejols; Optimization Methods in Finance, Cambridge University Press(Ch. 3, 4, 5)
- Grinold and Kahn; Active Portfolio Management, McGraw-Hill (Ch. 2, 3, 4, 5)
- Sironi, P.; Modern Portfolio Management: from Markowitz to Probabilistic ScenarioOptimization, Risk Books (Ch. 3, 4, 5)