

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

1. SUBJECT

- **Name:** Introduction to Data analytics and Big Data
- **Type of subject:** compulsory
- **Credits:** 4 ECTS
- **Hours dedication:** 24 hours (in classroom)
76 hours (out classroom)
- **Coordinator of the subject:** Javier Gomez Biscarri, Luz Mary Pinzón
- **Contact:** Javier.gomez@upf.edu, luzmary.pinzon@bsm.upf.edu
- **Professor:** Javier Gomez Biscarri, Luz Mary Pinzón
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2. COURSE DESCRIPTION

Contents

Introduction to data analytics in finance: types of financial data and their particular characteristics; the use of data analysis in finance: prediction and policy analysis
Python for financial data analysis (-Profits, -Volatility, -Value at Risk (VaR), Calculation of the efficient frontier).

Using probability theory,, probability distributions will be compared, time series and panel data analysis will be studied with financial case studies. The logic behind the methodologies will be emphasized. In particular, (i) linear regression models, (ii) linear time series models for dependent data (ARMA), (iii) non-linear variable volatility models (GARCH), and (iv) multivariate time series correlation models will be inculcated. Finally, discriminant analysis and principal component analysis will be studied. Several statistical analysis packages will be used, as well as generic software (R, Python...)

Specific Abilities

SA3. Proficiency in applying financial tools to estimate the value of financial products, real assets, and companies, through 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.

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

McKinney, Wes "Python for Data Analysis", O'Reilly Media, Inc., Gravenstein USA

López de Prado, Marcos "Advances in Financial Machine Learning" John Wiley & Sons, Inc., Hoboken, New Jersey.

Aurélien Géron "Hands-On Machine Learning with Scikit-Learn and TensorFlow" O'Reilly Media, Inc., 1005 Gravenstein, USA