COMILLAS
UNIVERSIDAD PONTIFICIA
ICAI ICADE CIHS

**GUÍA DOCENTE**
**2025 - 2026**

# FICHA TÉCNICA DE LA ASIGNATURA

## Datos de la asignatura

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| **Nombre completo** | Analítica de Datos Aplicada a las Finanzas/Applying Data Analysis in Finance |
| **Código** | E000014016 |
| **Impartido en** | Grado en Análisis de Negocios/Bachelor in Business Analytics [Tercer Curso] |
| **Nivel** | Reglada Grado Europeo |
| **Cuatrimestre** | Semestral |
| **Créditos** | 3,0 ECTS |
| **Carácter** | Optativa (Grado) |
| **Departamento / Área** | Departamento de Gestión Financiera |
| **Responsable** | Carlos Casarrubio |
| **Horario** | Published on the faculty website. |
| **Horario de tutorías** | To be announced in class. |
| **Descriptor** | This course provides a comprehensive introduction to applied quantitative investment analysis, covering the full workflow from data acquisition and processing to factor modeling, portfolio construction, backtesting, and performance attribution. Students work with real market data to analyze prices, returns, risk, fundamentals, valuations, consensus expectations, and multi-factor models (including Fama–French), while learning to control common biases and evaluate strategy robustness in professional-style backtesting environments. |

## Datos del profesorado

### Profesor

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| **Nombre** | Carlos Casarrubio Feijoo |
| **Departamento / Área** | Departamento de Gestión Financiera |
| **Correo electrónico** | ccasarrubio@comillas.edu |

# DATOS ESPECÍFICOS DE LA ASIGNATURA

## Contextualización de la asignatura

## Competencias - Objetivos

### Resultados de Aprendizaje

RA1: Aplicar las técnicas de Business Analytics en el contexto financiero de las empresas como apoyo a la toma de decisiones.

RA2: Identificar los elementos financieros clave que permiten aplicar en cada situación la técnica de análisis de datos adecuada que contribuyan a crear valor en la empresa.

# BLOQUES TEMÁTICOS Y CONTENIDOS

## Contenidos – Bloques Temáticos

### Block 1 – Price, return and risk analysis

Analysis of financial price series: simple and logarithmic returns, annualization, volatility, correlations and covariances. Time-frequency consistency across assets. Construction of momentum and rolling risk indicators.

### Block 2 – Fundamental data and relative valuation

Use of company financial statements for valuation analysis. As-reported vs standardized data, restatements, point-in-time series and information lags. Sector normalization, capital structure adjustment, and development of Value and Quality factors.

### Block 3 – Ratios, multiples and market consensus

Analysis of historical and forward multiples (P/E, EV/EBITDA, LTM, NTM, FY1, FY2). Interpretation of analyst consensus data, revisions, dispersion, and sentiment indicators. Comparison between reported-based and expectation-based valuations.

### Block 4 – Market factors and Fama–French models

Review of CAPM and extension to multi-factor asset pricing models. Construction of MKT, SMB, HML, RMW, CMA, and MOM factors. Estimation of betas and analysis of portfolio factor exposures using regression techniques.

### Block 5 – Portfolio construction and backtesting

Design of systematic factor-based portfolios (Value, Quality, Momentum, Low Volatility). Long–short and ranked portfolios. Rebalancing methodologies, transaction costs, turnover analysis, performance measurement (Sharpe, Sortino, Information Ratio), alpha evaluation, and bias control.

### Block 6 – Performance attribution and compounding effects

Application of Brinson–Fachler attribution methodology. Top-down and bottom-up analysis of performance drivers. Impact of compounding on multi-period attribution and interpretation of non-additive metrics.

### Block 7 – Factor selection and professional backtesting environment

Use of screening tools for factor selection and signal combination. Integration of screening results into a professional backtesting workflow. Evaluation of factor robustness, consistency, and implementation feasibility.

## METODOLOGÍA DOCENTE

### Aspectos metodológicos generales de la asignatura

The course is structured into six thematic blocks, each developed over two teaching sessions. The first session of each block is mainly theoretical and focuses on introducing concepts, methodologies and quantitative models. The second session is practice-oriented and is devoted to hands-on work with real financial data, implementation of analytical techniques and interpretation of results. This practical session may be complemented with independent work outside the classroom to reinforce learning and complete applied exercises.

## RESUMEN HORAS DE TRABAJO DEL ALUMNO

The course is structured into six thematic blocks, each developed over two teaching sessions. The first session of each block is mainly theoretical and focuses on introducing concepts, methodologies and quantitative models. The second session is practice-oriented and is

devoted to hands-on work with real financial data, implementation of analytical techniques and interpretation of results. This practical session may be complemented with independent work outside the classroom to reinforce learning and complete applied exercises.

## EVALUACIÓN Y CRITERIOS DE CALIFICACIÓN

Final written exam: 40% of the final grade.

Practical assignments and applied projects: 40% of the final grade.

Class participation and engagement: 10% of the final grade.

Continuous assessment activities: 10% of the final grade.

To pass the course, students must obtain a minimum grade of 5/10 both in the overall course grade and in the practical assignments component.

## BIBLIOGRAFÍA Y RECURSOS

### Bibliografía Básica

Koop, G. (2005). Analysis of Financial Data. Wiley.

Tsay, R. S. (2010). Analysis of Financial Time Series. Wiley.

Derindere Köseoğlu, S. (Ed.). (2022). Financial Data Analytics: Theory and Application. Springer.

### Bibliografía Complementaria

- Complementary bibliography:

Ang, A. (2014). Asset Management: A Systematic Approach to Factor Investing. Oxford University Press.

- Online resources:

Kenneth French Data Library – Factor datasets and academic documentation.

https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Damodaran Online – Valuation datasets and corporate finance resources.

https://pages.stern.nyu.edu/~adamodar/