COMILLAS
UNIVERSIDAD PONTIFICIA
ICAI ICADE CIHS

Syllabus
2025 - 2026

TECHNICAL SHEET OF THE SUBJECT

Data of the subject	
Subject name	Data Analysis for Decision Making
Subject code	E000011576
Mainprogram	Official Master's Degree in Business Administration - MBA
Involved programs	Máster Universitario en Administración de Empresas (MBA) [First year]
Level	Postgrado Oficial Master
Quarter	Semestral
Credits	3,0 ECTS
Type	Obligatoria
Department	Departamento de Métodos Cuantitativos
Coordinator	Alejandro Pérez Calvo
Schedule	Check 25-26 calendar
Office hours	Upon request
Course overview	Effective management of organizations requires recognizing the contributions that quantitative and analytical methods can make in bringing rationality to decision-making processes. In the context of this subject, a series of analytical tools and techniques commonly used in management and business are presented. This allows participants to become aware of which analytical techniques are available for decision-making, helps them appreciate the contribution these tools and techniques can make to effective decision-making, and also leads to an understanding of the limitations these analytical methods may have. The emphasis throughout the class is on the conceptual understanding of the tools and techniques rather than on the development of analytical skills.

Teacher Information	
Teacher	
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SPECIFIC DATA OF THE SUBJECT

Contextualization of the subject

Contribution to the professional profile of the degree

The course in the professional context

The effective management of organizations requires knowledge of the contributions that quantitative and analytical methods can have when it comes to providing rationality to decision-making processes. In the context of this subject a series of analytical tools and techniques commonly used in the field of management and business are presented.

Course objectives

- Provide students with the ability to analyze information and data as key elements for decision-making and the identification, formulation and resolution of business problems.
- Learn to do a basic descriptive treatment of a set of data, know how to extract conclusions from the same regarding the behavior of certain variables and be able to model simple economic phenomena.
- Provide students with the ability to analyze problems of the company and its environment using quantitative methods, distinguish appropriate analysis and modeling techniques and apply them to practical cases of prediction and simulation in business management.
- Provide students with a framework for understanding core data-related responsibilities such as:
- Measurement: Determining the impact of business efforts and marketing campaigns. • Optimization: Recommending changes in tactics or spending to improve results. • Experiments: Designing and executing tests to isolate causes. • Segmentation: Identifying groups and subgroups of customers and prospects. • Predictive modeling: Building models to improve performance rates. • Storytelling: Communicating messages derived from data to inspire better decisions
- Understand the importance of digital transformation and business technologies applied to data analysis.

Prerequisites

Those students without prior training in data analysis should take 2 credits of additional training in the field in order to homogenize starting levels

Competencies - Objectives

Competences

GENERALES	
CG01	Analytic and synthesis cognitive capacities applied to business situations and managing and organisation problems.
CG02	Management of data and information as key elements for decision-making and for identification, formulation and resolution of business problems.
CG03	Problem-solving and decision-making skills at a strategic, tactic and operational level with regard to a business, considering the interrelationship between the different functional and business areas.
CG09	Knowledge, understanding and handling of tools for diagnosis of the competitive position of a company, and designing and executing the company's strategic plan.
ESPECÍFICAS	
CE09	Being able to analyse the problems of the company and its environment through the understanding of data and information – their nature, collection, storage, modelling and extraction – and through the use of quantitative methods, and to identify appropriate analysis and modelling techniques and apply these same techniques to predictive and simulation case studies of business management.

THEMATIC BLOCKS AND CONTENTS

Contents - Thematic Blocks

MODULE 1: Business Data analysis

- Basics of Data Analytics
- Conducting Data Analytics for Businesses
- Data Analysis in the era of Big Data
- Artificial Intelligence applied to Data Analysis
- Ethics in Data & Analytics

MODULE 2: The Analytics Lifecycle

- Data Discovery, Preparation and Model
- Communicating Results
- The importance of "Thinking differently"

MODULE 3: Basic Descriptive Data Analysis

- Descriptive and Inferential Statistics
- Data Presentation: Tables and Charts
- KPIs, Metrics and Dashboards

MODULE 4: Risks of Data Analytics

- Uncertainty and Risk
- Probability Rules and Adjustments
- Business Challenges

MODULE 5: Analytical Methods: from time series to social media analysis

- Regression
- Classification
- Time Series, Text , Social and Sentiment Analysis

MODULE 6: Grouping the similar: Clustering

- Clustering overview
- K-means and Use Cases
- Real World examples

MODULE 7: Data Visualization and Technology

- Data Visualization basics
- Improving Data Visualization and Understanding
- Technology and Tools

TEACHING METHODOLOGY

General methodological aspects of the subject

In-class Methodology: Activities	
• Teaching lectures • Development of exercises and examples • Guided practice of cases applying the concepts learnt • Oral presentation of the applied practical cases done in group • Presentations by top industry professionals (guest speakers)	CG01, CG02, CG03, CG09, CE09
Non-Presential Methodology: Activities	
• Tutored personal work • Individual and group practice work • On-line assessment / tests	CG01, CG02, CG03, CG09, CE09

SUMMARY STUDENT WORKING HOURS

CLASSROOM HOURS		
Analysis and resolution of cases and exercises, individually or collectively	Lessons of an expository nature	Oral presentations of topics, cases, exercises and papers
10.00	10.00	10.00
NON-PRESENTIAL HOURS		
Analysis and resolution of cases and exercises, individually or collectively	Collaborative learning	
35.00	10.00	
ECTS CREDITS: 3,0 (75,00 hours)		

EVALUATION AND CRITERIA

The use of AI to produce full assignments or substantial parts thereof, without proper citation of the source or tool used, or without explicit permission in the assignment instructions, will be considered plagiarism and therefore subject to the University's General Regulations.

Evaluation activities	Evaluation criteria	Weight
Final exam	To pass the subject, the student should obtain at least the following: Final exam: 5/10	50
Public oral presentation (Group project)	Quality of the presentation and content. Min. score to pass: 5/10	15
Discussion questions, quizzes / tests	Active participation, score in tests/quizzes. Min. score to pass: 5/10	15

Cases & Exercises	Knowledge of the subject. Min. score to pass: 5/10	20

Ratings

To pass the subject, the student should obtain at least the following:

- Attendance Requirements: 80%
- Final exam: 5/10
- Cases, exercises: 5/10
- Public oral presentation: 5/10
- Total grade weighting all components equal or superior to 5/10

Those students that do not pass the subject will have:

a) to retake the final exam when they failed to pass the exam

b) repeat the oral presentation about a new topic when the failed to pass any of the other assessment items

Students with an attendance waiver

In order to pass the module, these students will have to the take the final exam (100% of grading), but it is highly recommended to do some of the other online activities in order to improve the final grade

Note: The uncontrolled use of AI technologies such as ChatGPT is not allowed. A plagiarism protocol will be applied to exercises and individual cases

AI usage level allowed: Allowed with specific conditions

BIBLIOGRAPHY AND RESOURCES

Basic Bibliography

- Class notes
- Handouts & slides
- External resources
- Books

"Quantitative Analysis for Decision Makers, 7th Edition" (formerly known as Quantitative Methods for Decision Makers), 7th Edition. MIK WISNIEWSKY. Pearson (2020). ISBN-13: 9781292276663

Complementary Bibliography

"Everyday Business Storytelling: Create, Simplify, and Adapt A Visual Narrative for Any Audience". JANINE KURNOFF, LEE LAZARUS. Ed. Wiley (2021). ISBN 978-1119704669

"Big Data: Using Smart Big Data, Analytics and Metrics to Make Better Decisions and Improve Performance". BERNARD B. MARR Ed. John Wiley & Sons (2015). ISBN 978-111-89-6583-2

"Data Science for Business: What you need to know about data mining and data-analytic thinking". FOSTER PROVOST Ed. O'Reilly Media (2013). ISBN 978-144-93-6132-7

"Data Science& Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data". EMC EDUCATION SERVICES. Wiley (2015). ISBN:9781118876138

"Artificial Intelligence: A Modern Approach". RUSSELL STUART, NORVIG PETER. Ed. Pearson Series in Artifical Intelligence (2020). ISBN 978-0134610993

Online resources:

https://www.datasciencecentral.com/

https://colab.google/