



TECHNICAL SHEET OF THE SUBJECT

Data of the subject	
Subject name	Data Analysis for Decision Making
Subject code	E000011576
Main program	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 24-25 calendar
Office hours	Upon request
Course overview	Data Analysis for Decision Making

Teacher Information	
Teacher	
Name	Alejandro Pérez Calvo
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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 <p>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.</p>
Course objectives <ul style="list-style-type: none">• 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.	
	RA01	Describe, relaciona e interpreta situaciones y planteamiento de nivel medio.
	RA02	Selecciona los elementos más significativos y sus relaciones en las situaciones planteadas.
	RA03	Identifica las carencias de información y establece relaciones con elementos externos a la situación planteada.
	RA04	Es capaz de resumir y estructurar la información empleando los conceptos adecuados.
CG02	Management of data and information as key elements for decision-making and for identification, formulation and resolution of business problems.	
	RA01	.Busca, conoce, sintetiza y utiliza adecuadamente datos primarios y secundarios procedentes de diversas fuentes.
	RA02	Conoce y usa Internet para buscar y manejar información, textos y datos.
	RA03	Discierne el valor y la utilidad de diferentes fuentes y tipos de información.
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.	
	RA01	Identifica y define adecuadamente el problema y sus posibles causas.
	RA02	Plantea posibles soluciones pertinentes y diseña un plan de acción para su aplicación.
	RA03	Identifica problemas antes de que su efecto se haga evidente.
	RA04	Dispone de la capacidad para tomar decisiones de una forma autónoma.



	RA05	Reconoce y busca alternativas a las dificultades de decisión en situaciones reales.
	RA06	.Es capaz de ponderar diferentes factores (económicos, sociales y técnicos, entre otros) en el proceso de toma de decisiones y determinar su impacto.
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.	
	RA01	Realiza sus trabajos y su actividad necesitando sólo unas indicaciones iniciales y un seguimiento básico.
	RA02	Busca y encuentra recursos adecuados para sostener sus actuaciones y realizar sus trabajos.
	RA03	Amplía y profundiza en la realización de sus trabajos.
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.	
	RA01	Aplica la abstracción y la simplificación para modelar en términos matemáticos el problema al que se enfrenta.
	RA02	Conoce los instrumentos matemáticos necesarios para la modelización.
	RA03	Integra el análisis gráfico, verbal y los datos cuantitativos y cualitativos al estudio de cuestiones decisorias relacionadas con el problema.
	RA04	Es capaz de interpretar los resultados obtenidos y usarlos para tomar decisiones de manera razonada.

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

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



COMILLAS

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CIHS

Syllabus
2024 - 2025

In order to pass the module, these students will have to 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: It is not permitted to use AI technology, such as ChatGPT or similar software to complete assignments. Rules apply to all cases and exercises.

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 Artificial Intelligence (2020). ISBN 978-0134610993

Online resources:

<https://www.datasciencecentral.com/>