COURSE DATA

DATA SUBJECT

Code: 36537
Name: Prospective Analysis & Scenario Simulation Methods
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1332 - Degree in Business Intelligence and Analytics	Facultat d'Economia	4	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1332 - Degree in Business Intelligence and Analytics	Análisis Prospectivo. Simulación de Escenarios	ELECTIVES

COORDINATION

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SUMMARY

Prospective Analysis & Scenario Simulation Methods is an elective training subject belonging to the area of Quantitative Methods for Economics and Business, taught in the second semester of the fourth year of the Bachelor's Degree in Business Intelligence and Analytics, with a total workload of 6 ECTS credits.

In a degree program aimed at training professionals with deep knowledge of business and the ability to explore and exploit the growing flows of data (both internal and external) provided by the new digital reality, a subject like Prospective Analysis & Scenario Simulation Methods serves as a suitable complement to systematically and organizedly explore potential events that may impact our business, company and/or institution, or our immediate environment.

Scenario analysis is the process of examining and evaluating possible events or scenarios that could occur in the future and predicting the various feasible outcomes. For example, it could be used to estimate changes in the value of a business or cash flow in the event of potentially favorable or unfavorable events that could affect the company.

To perform these analyses, it is not only important to imagine possible scenarios, but it is also necessary to be able to construct a model of the business, with its systemic structure of relationships, that can be

computationally implemented and allows us to discover how certain key variables respond to shocks or changes in the basic inputs.

Scenario analysis, informed by simulation processes, is used by the majority of business executives during their decision-making process to understand the range of possibilities (best and worst-case scenarios), anticipating potential gains or losses.

When facing a new business venture, an investment project, or simply in our day-to-day work, reducing the uncertainty of what could happen through a prudent approach of exploring both favorable and unfavorable cases is useful for several reasons: (i) improving future planning, (ii) adopting a proactive attitude, and (iii) reducing risk and the likelihood of failure.

In summary, this subject aims to provide future graduates with planning and foresight techniques, equipping them with tools and protocols to react diligently and minimize losses in the face of adverse events, all done in a systematic and organized manner. The main reason for the necessity of such a subject is that the world is uncertain and unforeseen events occur, thus requiring us to consider different scenarios (by altering assumptions) and study their impact on outcomes.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

While no specific restrictions have been established, it is assumed that in order to successfully enroll in this subject, the student has been previously exposed to the content of the following courses in the degree program: Exploratory Data Analysis and Databases, Probability, Uncertainty, and Inference, Data Mining in Business, Time Series Analysis and Forecasting, and Spatial and Spatio-temporal Data.

COMPETENCES / LEARNING OUTCOMES

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Acquire basic training that can be used to learn new methods and technologies and to adapt to new situations in academic and professional areas.

Be able to access and manage information in different formats for subsequent analysis in order to obtain knowledge through data.

Be able to make autonomous decisions in digital environments characterised by the abundance and dynamism of data.

Be able to plan, organise, monitor and evaluate the implementation of business strategies.

Be able to produce models, calculations and reports, and to plan tasks in the specific field of business

intelligence and analytics.

Be able to solve problems and to communicate and spread knowledge, skills and abilities, taking account of the ethical, egalitarian and professional responsibility of the activity of business intelligence and analytics.

Be able to use ICT, both in academia and in professional practice.

Be able to work in a team demonstrating commitment to quality, ethics, equality and social responsibility.

Demonstrate skills for analysis and synthesis.

Understand the impact of economic, political-legal, socio-cultural, technological and environmental variables on business activity.

DESCRIPTION OF CONTENTS

1. STRATEGIC ANALYSIS

In the section of "Strategic Analysis" fundamental concepts and tools will be addressed to understand the business environment and evaluate the competitive position of an organization. Strategic analysis models, such as SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats), will be explored, and common business strategies will be reviewed.

2. FORECASTING AND PROSPECTIVE

In the section of "Forecasting and Prospective" students will learn to anticipate and predict possible future scenarios through the use of prospective techniques and methods. Trends will be analyzed, key factors will be evaluated, and tools such as future scenario and predictive model construction will be examined.

3. PLANNING

In the section of "Planning," the fundamentals of strategic and tactical planning will be studied. The processes of goal setting, strategy formulation, and action plan development will be explored. Different approaches and methodologies used in business planning will be analyzed.

4. VARIABLES AND ACTORS

The section on "Variables and Actors" will focus on the identification and analysis of internal and external variables that influence the business environment. Different actors and agents involved in the business system will be examined, and their impact on decision-making will be evaluated.

5. DELPHI METHOD

The Delphi method will be studied as a technique for collecting expert opinions to achieve consensus in situations of uncertainty. Its application in the strategic decision-making process will be explored, and its advantages and limitations will be analyzed.

6. SIMULATION TECHNIQUES

Regarding "Simulation Techniques" different methods and tools for simulating future scenarios and events will be examined. Techniques such as Monte Carlo analysis and discrete event simulation will be studied, and their utility in decision-making and risk evaluation will be analyzed.

7. STRUCTURAL AND DIVERGENT ANALYSIS

In the "Structural and Divergent Analysis" section, the identification and evaluation of the structure and dynamics of business systems will be addressed. Approaches such as network analysis, dependency analysis, and influence analysis will be explored, as well as techniques to foster the generation of divergent ideas in the decision-making process.

8. UNKNOWN UNKNOWNS

"Unknown Unknowns" refers to the unknown and unpredictable elements in the business environment. This topic will explore uncertainty management and analyze strategies for addressing situations where there are unknown factors and unforeseen events.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	15,00
Computer classroom practice	45,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	30,00
Independent study and work	40,00
Preparation of lessons	0,00
Preparation for assessment activities	20,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

The development of the subject is mainly structured around practical activities and case studies, where theoretical content will be introduced, consolidated, and reinforced through the resolution of practical examples.

In the theoretical-practical sessions, with a total weekly duration of 4 hours, the main topics of the subject will be presented, introducing the relevant elements and concepts and contextualizing them to different forecasting and prediction problems within a business environment and business application.

During the sessions, the teacher will propose to the students situations (real or fictional) based on problems or case studies that they will have to solve using appropriate techniques and software programs, carrying out oral presentations or debates, individually and/or in teams if applicable. Throughout the sessions, students will be presented with situations that they will need to solve by delivering the determined outputs in a timely manner.

EVALUATION

The subject will be evaluated through the following procedure:

- Continuous assessment, based on the participation and level of involvement of the student in the teaching-learning process, taking into account regular attendance to the planned activities and the resolution of questions and problems proposed periodically. This section will account for 10% of the final grade for the subject.
- Teamwork assignments. Two team assignments will be carried out, allowing students to apply

some of the techniques discussed in the course. This section will account for 40% of the final grade for the subject.

- Written exams. Two multiple-choice exams will be conducted. The first one will cover the contents of topics 1 to 4, and the second one will focus on the contents of topics 5 to 8. This section will account for 20% of the final grade for the subject.

- Final project. A final project will be completed, where each student individually applies the knowledge acquired during the course. This section will account for 30% of the final grade for the subject.

To apply the above percentages, it will be necessary to obtain a minimum grade of 4 out of 10 in the final project.

REFERENCES

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- Bradimarte, P. (2014) Handbook in Monte Carlo Simulation: Applications in Financial Engineering, Risk Management, and Economics. Wiley Handbooks in Financial Engineering and Econometrics.

- Godet, M. (2006). Creating Futures: Scenario Planning as a Strategic Management. Economica Editions.

- Godet, M. y Durance, P. (2011). Strategic Foresight for Corporate and Regional Development. DUNOD - UNESCO - Fondation Prospective et Innovation

- Kuhn, M. y Johnson, K. (2016) Applied Predictive Modeling. Springer. New York.

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- McLeish, D.L. (2005). Monte Carlo Simulation and Finance. Wiley Finance Series.

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