

Efficient decision making with simulation and analysis

Master's Degree: Supply Chain Management

Subject: Innovation decisions: simulations, analysis and technologies

Credits: 6 ECTS

Program: Master in Supply Chain Management

Modality: On-campus (Full-Time)

Semester: Second

Type: Mandatory

Language of instruction: English

Academic year: 2025/2026

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1. Presentation

The subject "Efficient decision making with simulation and analysis" in a supply chain master's degree is justified by its relevance in the current business context. First, it provides students with the tools and skills necessary to address the complex challenges that companies face in making strategic and operational decisions in the supply chain arena.

In this sense, the use of simulations and analysis allows students to understand and evaluate varied scenarios, including market demand, inventory management, optimization of distribution routes, among others, which contributes to improving efficiency, operational and cost reduction.

Likewise, the subject encourages the development of analytical skills and the ability to interpret large volumes of data, which is essential in an environment where making informed and data-based decisions is crucial for the success of the supply chain.

In addition, it provides the opportunity to apply modelling and simulation approaches to anticipate and mitigate risks, as well as to identify opportunities for improvement in logistics and operational processes, which translates into greater agility and adaptability in supply chain management.

Finally, this subject prepares students to face real situations in the business environment, providing them with the necessary skills to make informed and strategic decisions that positively impact the performance and competitiveness of organizations in the field of the supply chain.

2. Program's learning outcomes

The program-related learning outcomes are distributed as follows:

2.1. Knowledge

- RAT 1 The graduate will be able to describe correctly complex supply chains and their adaptation to the organization's needs for permanent change.
- RAT 2 The graduate will be able to assertively identify developments in information technology applied to supply chain management.
- RAT 3 The graduate will be able to describe correctly a schedule and cost contingency scenario based on the results of a quantitative risk analysis in the development of the supply chain business.

2.2. Skills

- RAT 7 The graduate will be able to provide clear and precise explanations of any knowledge/information, both orally and in writing, in Catalan, Spanish and a third language, particularly English.
- RAT 8 The graduate will be able to apply digital technologies (at the right time) in their field of expertise.
- RAT 10 The graduate will know how to apply the knowledge acquired in new or unfamiliar environments, as well as in multidisciplinary contexts related to the supply chain area by means of the resolution of practical cases.
- RAT 11 The graduate will be able to apply in an efficient way the keys of e-Commerce to the area of operations and logistics in a multi-channel environment.
- RAT 12 The graduate will be able to adequately coordinate individual and team efforts and skills for the correct development and fulfilment of operational objectives.
- RAT 15 The graduate will be able to assertively interpret the complementary concepts of planning and execution in a practical and efficient manner.

2.3. Competences

- RAT 17 The graduate will be able to come up with innovative, creative and entrepreneurial solutions in professional situations.
- RAT 18 The graduate will be able to evaluate the sustainability and social impact of the proposals presented, with ethical, environmental and professional responsibility.
- RAT 19 The graduate will be able to apply the gender perspective in the professional tasks.
- RAT 21 The graduate will be able to restructure in an efficient way the teams of the company's functional departments involved in the supply chain.
- RAT 22 The graduate will be able to adequately integrate the innovation elements in the supply chain management of a company or organization.
- RAT 25 The graduate will be able to evaluate the business risks for their correct use in the development of action plans related to the supply chain.

3. Subject's learning outcomes

The graduate will be able to apply the gender perspective in the professional tasks.

- RAM 1 The graduate will be able to accurately analyze the impact of business decisions in the area of operations and logistics, preparing a report on a real company case.
- RAM 2 The graduate will be able to devise predictive models for application in the context of the supply chain, through the study of statistical measurement and data collection tools.

- RAM 3 The graduate will be able to reliably use mathematical optimizers to improve the supply chain, by carrying out a group project.
- RAM 4 The graduate will be able to evaluate the impact of new technologies on supply chain activities by carrying out a SWOT analysis.

4. Contents

- **Topic 1:** Simulation of business decisions using the Fresh Connection platform
 - Introduction to the Fresh Connection platform
 - Modeling of supply chain scenarios
 - Strategic and operational decision making
 - Analysis of results and performance
 - Collaboration and teamwork
 - Experiential learning

- **Topic 2:** Descriptive analytics: indicators that show the status and evolution of the supply chain
 - Importance of descriptive analytics in the supply chain
 - Types of descriptive indicators
 - Performance metrics
 - Analysis of trends and evolution
 - Data visualization
 - Usefulness in decision making

- **Topic 3:** Predictive models and their application in the supply chain
 - Usefulness of predictive models
 - Types of predictive models
 - Relevant data and variables
 - Validation and precision of the models
 - Applications to the supply chain
 - Integration with management systems

- **Topic 4:** Mathematical optimizers: concepts, techniques and practical applications
 - Application of mathematical optimizers in the supply chain
 - Optimization models in the supply chain
 - Variables and restrictions in optimization models

- Optimization problem solving techniques
- Practical applications in the supply chain
- Challenges in implementation

• **Topic 5:** Dynamic simulation models for discrete events: creation of digital twins

- Dynamic simulation models for discrete events
- Fundamentals of discrete event simulation
- Development of digital twins
- Implementation of dynamic simulation models
- Applications in supply chain management

5. Methodology

The methodology applied to this subject, framed within the educational model of EAE Business School, LifEd, is detailed in the following table:

PRESENIAL MODALITY		
Learning Outcomes	Teaching Methodology	Training Activities
Knowledge	Lecture	Conferences
	Presentation sessions	Student presentations
	Audiovisual-based learning	Analysis of audiovisuals
	Tutorials	Meetings to resolve doubts Follow-up meetings
Skills	Project work	Problem-solving Information searching and processing Presentation of reports and/or work
	Case-based learning	Information searching and processing Problem-solving
Competencies	Game-based learning	Challenges
	Inquiry-based learning	Research tasks
	Project work	Report preparation - Presentation of reports or work

6. Grading system

Continuous assessment

Grading system	Weight
Block 1: Exercises, Problems, Report Preparation, Assignments, Presentations	40 %
Block 2: Participation and Oral Presentations	20 %
Block 3: Final Evaluation Test	40 %

Block 1 will consist of:

- Two individual evaluable activities. 10% each.
- Two group projects or reports. 10% each.

Block 2 will consist of:

- Participation and oral presentations – 20%.

Block 3 will consist of:

- An exam - 40%.

The final grade for the course will be obtained by weighting the three blocks. The minimum weighted grade required to pass is 5.0.

If the student fails Block 1 or Block 3 (or both) with a grade lower than 5.0, they may retake that block or blocks. This grade will average with the other blocks, and the maximum final grade the student can receive is 5.0.

If the student is unable to attend the initial evaluation, and can provide a justified reason (see regulations of the University of Lleida), they may take the exam on the date set for recovery.

Students who do not attend evaluative activities with a weight exceeding 50% will receive a general course grade of “Not presented.”

Alternative Evaluation

The single evaluation consists of a single exam that accounts for 100% of the course. The exam, and therefore the course, is passed with a grade of 5 out of 10 in this final test. If a grade lower than 5.0 is obtained, the student has the right to a recovery exam.

To opt for the single evaluation, it is necessary to send a written request to the coordination during the first 15 business days of the course. The procedure to follow to opt for this single evaluation is established in the specific rules of EAE.

Plagiarism is a fraudulent activity that can lead to severe penalties, both academic and legal. Academic honesty is one of the pillars of the educational commitment of the School, and the members of its

teaching community are especially aware and prepared to detect such actions. Given the difficulty often involved in conceptualizing plagiarism, it has been deemed appropriate to clearly define its content and scope in these regulations and policies.

Plagiarism is understood as the appropriation of works or other people's work by passing them off as one's own; that is, without explicitly crediting their origin. Plagiarism can consist of the unauthorized total or partial copying of someone else's work, or presenting the copy as an original work, impersonating the true author. Some examples of plagiarism are:

- Submitting someone else's work as if it were your own, regardless of whether the copy is total or partial.
- Paraphrasing a text by rephrasing it with other words, but making small changes in the language to disguise it and without citing sources.
- Buying or obtaining a work and presenting it as one's own.
- Relying on an idea or phrase from another person to write a new paper without citing the author of the work.

As established in Article 10 of the Academic Code of Conduct for Students at EAE Barcelona, without prejudice to the academic sanctions resulting from its application, the Academic Commission will promote the legal actions that correspond in case plagiarism could violate applicable regulations regarding intellectual property.

7. Bibliography

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