TECHNICAL SHEET OF THE SUBJECT

Data of the subject	
Subject name	Analítica de Datos en la Gestión de la Cadena de Suministros/Supply Chain Management Fundamentals and Analytics
Subject code	E000014017
Mainprogram	Grado en Análisis de Negocios / Business Analytics por la Universidad Pontificia Comillas
Involved programs	Grado en Análisis de Negocios/Bachelor in Business Analytics [Third year]
Level	Reglada Grado Europeo
Quarter	Semestral
Credits	6,0 ECTS
Type	Obligatoria (Grado)
Department	Departamento de Gestión Empresarial
Coordinator	Enrique Díaz-Plaza Sanz; Lucía Barcos Redín
Office hours	Students should contact the professor via email to schedule a tutoring session
Course overview	To understand how supply chains are managed and how data-driven decisions are made, it is essential to first grasp a set of fundamental concepts. For this reason, the course Supply Chain Management Fundamentals and Analytics (6 ECTS) is structured around two main pillars. The first addresses the foundations of Operations Management and Supply Chain Management. The second focuses on how companies manage supply chains in an integrated manner, introducing the tools and technologies available for data-driven decision-making and for risk management.

Teacher Information	
Teacher	
Name	Enrique Díaz-Plaza Sanz
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SPECIFIC DATA OF THE SUBJECT

Contextualization of the subject
Contribution to the professional profile of the degree
In this course, students will gain an understanding of how data analytics contributes to more informed and efficient decision-making in the field of logistics and supply chain management. To achieve this, the course first provides students with essential knowledge of Operations Management and Supply Chain Management, which will help them understand the context in which analytical problems arise. Furthermore, students will explore how companies manage supply chains in an integrated manner, applying different analytical tools and technologies both for data-driven decision-making and for risk management.
Prerequisites
Basic knowledge of statistics, data analytics, and programming.

Competencies - Objectives

Competences

Learning outcomes

RA3	Analítica de Datos en la Gestión de la Cadena de Suministros/Supply Chain Management Fundamentals and Analytics (6 ECTS). Aplicar las herramientas y tecnologías disponibles para la toma de decisiones en Cadena de Suministro basadas en datos
CN1	Reconoce en la naturaleza propia de la analítica de negocio, de sus conceptos y de sus herramientas esenciales (análisis estadístico y cuantitativo, modelos exploratorios y predictivos y sistemas de información), el valor que supone en términos de optimización para la organización, las oportunidades derivadas de la información para apoyar la toma de decisiones directivas.
HA1	Aplica las herramientas de apoyo al directivo en el proceso de diagnóstico previo a la toma de decisiones estratégicas, atendiendo especialmente a escenarios de cambios y transformación en entornos globales y digitalizados.

THEMATIC BLOCKS AND CONTENTS

Contents - Thematic Blocks

The content of the course is structured around the thematic blocks outlined below. The intended learning outcomes associated with these contents are:

RA1. Explain the fundamental concepts related to Operations Management in general, and more specifically to Supply Chain Management.

RA2. Identify how companies manage the Supply Chain in an integrated manner and analyze the impact of such integration.

RA3. Apply available tools and technologies to support data-driven decision-making in Supply Chain Management.

In addition, the course also aims for students to:

CN1. Recognize, in the nature of business analytics—its concepts and core tools (statistical and quantitative analysis, exploratory and predictive models, and information systems)—the value it brings in terms of organizational optimization, as well as the opportunities that arise from data to support managerial decision-making.

HA1. Apply decision-support tools for management in the diagnostic phase prior to strategic decision-making, with particular focus on scenarios of change and transformation in global and digitalized environments.

Topic 1: Introduction to the Supply Chain

Definition, scope, evolution, and trends of the supply chain. Decision levels. Decision-making, performance indicators, and sustainability in the supply chain

Topic 2: Strategic Sourcing

Key concepts of strategic sourcing. Overall strategy and sourcing models. Risk management in strategic sourcing. Analytics, innovation, and future trends.

Topic 3: Inventory Management

Basic concepts of inventory management. Inventory management models. Indicators related to inventory management. Technology and analytics applied to inventory management.

Topic 4: Demand Forecasting and Demand Management

Basic concepts, definition, and scope of demand forecasting and demand management. The bullwhip effect. Forecasting methods and approaches. Measurement and evaluation of forecast accuracy. Collaborative forecasting.

Topic 5: Transportation, Logistics, and Physical Distribution

Basic concepts of logistics and physical distribution. Supply chain network design and location decisions. Transportation systems and applied technologies. Internal logistics operations. Case studies of analytical applications. Sustainability and resilience.

TEACHING METHODOLOGY

General methodological aspects of the subject

The activities included in both the in-class and non-presential methodology are detailed below. In general terms, all course activities will promote a responsible and critical use of artificial intelligence tools such as ChatGPT. Following the classification proposed by Perkins et al. (2024), a level 3 integration is adopted, which means that students may use these tools to support tasks such as analysis, scenario exploration, idea testing, text reformulation, and style checking; all in combination with their own academic judgment and traditional bibliographic sources, validating and justifying the results. The final outcome must reflect the personal work of the group or the individual student. AI may act as an assistant, but it must not replace analytical skills, critical judgment, or the development of original content. Students will be required to be transparent in declaring their use of AI. The aim is not to substitute human reasoning, but rather to enrich the learning process and enhance analytical competencies in Supply Chain through an ethical, critical, and reflective use of these technologies.

In-class Methodology: Activities

1. Lectures, in which the instructor will present the main contents in a clear, structured, and engaging manner, generally supported by multimedia resources. Key aspects will be outlined to guide students' learning process, while encouraging and considering student suggestions.
2. Practical classes, where the instructor introduces basic concepts with active student participation through discussions and debates aimed at deepening content comprehension. These sessions will include dynamic presentations and both regulated and spontaneous student involvement through various activities.
3. Case analysis and problem-solving, based on materials provided by the instructor, brief readings, or other relevant data and information that allow students to apply acquired knowledge. Cases will generally be based on real situations and problems, using either real or synthetic data. Different analytical and programming tools will be employed for the analysis.
4. Presentations of specific topics or cases, involving the presentation and defense of cases before the class and instructor. These may be carried out individually or in teams. Evaluation will consider conceptual organization, subject knowledge, clarity of presentation, respect and consistency throughout all stages, and—in the case of group work—the active collaboration of all team members.
5. Tests and examinations, including different types of assessments: written exams on course content, practical tests linked to in-class or follow-up activities, short quizzes to verify the assimilation of general or specific concepts, as well as exercises or assignments that may be completed entirely in class or as complementary preparation or follow-up outside the classroom.

Non-Presential Methodology: Activities

1. Independent study and review of course materials, aimed at understanding, reworking, and assimilating scientific content with a focus

on practical application. This includes individual reading of texts and materials (books, reviews, articles, press releases, online documents, cases, etc.) related to the course. All materials and guidelines are available on the course website.

2. Practical case-solving using programming and data analysis tools.

3. Assignments and practical exercises, to be completed individually or in groups.

4. Individual or group academic tutoring, aimed at resolving questions or difficulties that may arise during the learning process.

SUMMARY STUDENT WORKING HOURS

CLASSROOM HOURS		
Lecciones de carácter expositivo	Ejercicios y resolución de casos y de problemas	Exposición pública de temas o trabajos
30.00	25.00	5.00
NON-PRESENTIAL HOURS		
Estudio y lectura organizada	Ejercicios y resolución de casos y de problemas	Trabajos monográficos y de investigación, individuales o colectivos
30.00	30.00	30.00
ECTS CREDITS: 6,0 (150,00 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	The final exam will assess both theoretical and practical knowledge. A minimum grade of 4.5 out of 10 is required for the exam to be considered in the weighted average with the other assessment components and in order to pass the course	45 %
Assessment Tests	Completion of one or more intermediate tests in which students must demonstrate the theoretical and practical knowledge acquired up to that point.	15 %
Individual Assignment	Students will be required to complete a series of practical assignments throughout the course. Evaluation of this work may be carried out through submission and/or through tests or quizzes designed to confirm that the required knowledge has been acquired.	15 %

Group Assignment	Teamwork and practical application of theory. The improper use of generative artificial intelligence (e.g., ChatGPT) will be subject to sanction. See NOTE on this matter.	15 %
Active Student Participation	A positive attitude towards the course will be assessed, taking into account aspects such as attendance and active participation in class, interest shown in the subject, submission of exercises, completion of quizzes/Kahoots, etc.	10 %

Ratings

ASSESSMENT IN THE ORDINARY EXAM SESSION

The final grade of the course will be calculated by applying the weighting criteria of the different assessment activities indicated previously. In order to pass the course, students must achieve a weighted total of at least 5.0 out of 10. As also specified above, obtaining a grade lower than 4.5 out of 10 in the Final Exam will result in the non-application of the weightings of the other assessment activities. In such a case, the final grade for the course will be the grade obtained in the Final Exam.

ASSESSMENT IN THE EXTRAORDINARY EXAM SESSION

Students who fail the ordinary exam session, as well as those exempt from regular attendance, repeating students, exchange students, or students undertaking approved internships authorized by the corresponding Academic Directorate, will only take a theoretical-practical exam. The final grade for the course will be the grade obtained in this theoretical-practical exam, with a minimum of 5.0 out of 10 required to pass.

NOTE ON THE MISUSE OF GENERATIVE ARTIFICIAL INTELLIGENCE IN ALL ASSESSMENT ACTIVITIES

The improper, uncritical or excessive use of artificial intelligence tools, without providing personal review, reflection, or academic justification, may be considered a breach or fraud within the assessment system and may negatively affect the final grade. See also the "General methodological aspects of the subject" subsection.

In accordance with the University's General Regulations, Article 168.2.e, it is considered a serious offense to engage in "actions intended to falsify or defraud academic performance assessment systems." The consequences of such misconduct include "temporary expulsion of up to three months or prohibition from taking exams in the following exam session after the sanction is imposed, in one or several courses in which the student is enrolled, [...] in addition to receiving a failing grade (0) in the respective course, [...] and prohibition from sitting the exam for that course in the following session."

BIBLIOGRAPHY AND RESOURCES

Basic Bibliography

CHOPRA, S. (2018) "Supply Chain Management: Strategy, Planning, and Operation" 7th ed. Pearson.

HEIZER J.; RENDER, B., MUNSON, C. (2023). Operations Management: Sustainability and Supply Chain Management (14th Edition). Pearson.

JACOBS, F.R.; CHASE, R.B. (2021). Operations and Supply Chain Management.(16th Edition). McGraw Hill.

KRAJEWSKI, L.J.; MALHOTRA, M.K.; RITZMAN, L.P. (2018). Operations Management: Processes and Supply Chains (12th Edition). Pearson.

LEPORATI, M.; MARTUL VÁZQUEZ, L.; MORALES CONTRERAS, M.F. (2021). GLOBAL SUPPLY CHAIN. An integrative View. Ed. Thomson Reuters, Aranzadi.

MYERSON, P. A. (2015). Supply chain and logistics management made easy: Methods and applications for planning, operations, integration, control and improvement, and network design. Pearson Education, Inc.

MANDL,C. (2023). Procurement Analytics: Data-Driven Decision-Making in Procurement and Supply Management. Springer Cham : Springer Nature Switzerland.

Complementary Bibliography

Perkins, M., Furze, L., Roe, J., & MacVaugh, J. (2024). The Artificial Intelligence Assessment Scale (AIAS): A Framework for Ethical Integration of Generative AI in Educational Assessment. Journal of University Teaching and Learning Practice, 21(6). https://doi.org/10.53761/q3azde36.