



Operations and Supply Chain Management I

(Supply Chain Management: Gestion de la Cadena de Suministro)

August - December 2026

Term VII

**Gareth Rees
Edgardo Jorge**

I. General Course Information

Subject:	Operations and Supply Chain Management 1		
Pre-requisite:	Operations Research I	Code:	18943
Precedent:	None	Semester:	2026-2
Credits:	3	Term:	VII
Weekly Hours:	4 hours	Course type:	In Person
Course Type Career	Compulsory: Industrial and Commercial Engineering Information Technology and Systems Engineering	Course Coordinator:	Gareth Rees: grees@esan.edu.pe

II. Summary

This course covers theoretical and practical topics. It seeks to develop competencies in the analysis of key elements associated with the design and administration of supply chains, considering the efficient integration of suppliers, manufacturers, distributors and retail outlets.

The course focuses on the criteria and tools that students can utilize to manage costs while analyzing the relationship between supply chain and business functions. It seeks to monitor customer management and the creation of value, the integration of order processes with inventory management, warehousing systems, outsourcing and transportation (national and global) while monitoring the supply chain's performance.

III. Course Objectives

The objective of the course is to generate models and strategies for effective integration of the supply chain network to improve the competitiveness of the company. Students are asked to describe and analyze various supply chain situations from a range of strategic and operational contexts and are expected to offer improvement suggestions.

IV. Learning Results

At the end of the course, the students will be able to:

- Classify the roles and stages of supply chains and how these may improve supply chain network performance.
- Identify and describe different Supply Chain strategies to ensure optimum Supply Chain performance and alignment with Operations strategies and processes.
- Identify the need to measure and assess the performance of firms and their Supply Chains.
- Demonstrate a basic level of understanding of the SCOR model to interpret Supply Chain performance.
- Define and contrast the concepts of Ethical and Sustainable Supply Chains and the benefits for the organization and the needs of society of these.
- Evaluate purchasing and sourcing decisions in terms of the benefits and risks.
- Apply and calculate different demand planning techniques, manufacturing strategies, inventory control, facility management systems, transportation mix strategies, and location decision-making tools in the global context of the supply chain operations.
- Able to function effectively as an individual, as a member or leader of diverse teams.
- The ability to apply knowledge of mathematics, science, and engineering to solve complex engineering problems.

- Create, select, and use modern engineering and information technology techniques, skills, resources, and tools, including prediction and modeling, with an understanding of their limitations.
- Recognize the need for lifelong learning and the ability to face it in the broader context of technological change.

V. Methodology

During the development of the course, sessions will contain student presentations and discussions in multidisciplinary teams. The topics will be about theoretical aspects learned in class, where students are encouraged to use their knowledge and creativity to answer questions and solve problems with the lecturer's guidance. Teamwork will be combined to reinforce the learning process and to develop the necessary skills in the participant, to perform successfully.

Theoretical lectures will provide students with essential background knowledge that are reinforced with visual tools (videos) about relevant topics of supply chains.

The assessment is continuous and comprises the following: Four (4) quizzes on assigned chapters and an additional academic paper to be taken on Moodle platform and two (2) practice and interpretation-based assessments, to be taken in person in a computer lab using an excel question and answer sheet. Additionally, there are two group projects, which must be completed in teams of three to six students that relate to the analysis of real business supply chain situations and contexts.

The two formative assessments in this class (Group Projects) will be completed in Learning Teams of three to five students. If you experience difficulties working with your team, you are expected to resolve them within the team, if possible, first. However, if you cannot find a resolution then promptly inform your instructor for guidance if you have concerns in this area.

VI. Evaluation

The evaluation system is comprehensive and continuous. It is subdivided as follows: Permanent evaluation (70%) and final exam (30%).

The final grade (PF) will be obtained in the following way:

$$PF = (0,70 \times PEP) + (0,30 \times EF)$$

Where:

PF = Final Grade (PF)
PEP = Continuous Evaluation (PEP)
EF = Final Exam (EF)

The permanent evaluation results from the weighted average of the evaluations that correspond to the assessment of the student's learning process: Quizzes Presentations / Research projects / Graded Practical work and session focused on exercises. The average of these grades provides the corresponding grade.

The weights within the permanent evaluation are described in the following table:

AVERAGE PERMANENT EVALUATION (PEP) 70%		
Evaluation Type	Description	Weight
Quiz	4 online Moodle quizzes (5% each)	20%
Method test	Two practical-based assessments (20% each) taken in Computer Lab	40%
Group assignments	Two Group Projects (Report & Presentation) (15% each)	30%
Participation	Attendance, punctuality and class participation	10%

VII. Programmed Content

WEEK	CONTENTS	ACTIVITIES / EVALUATION
LEARNING UNIT I: INTRODUCTION TO SUPPLY CHAINS AND THEIR MANAGEMENT		
LEARNING OUTCOME: - Classify the roles and stages of supply chains and how these may improve supply chain network performance. - Identify and describe different Supply Chain strategies to ensure optimum Supply Chain performance. - Identify the need to measure and assess the performance of firms and their supply chains. - Demonstrate a basic understanding of the SCOR model to interpret supply chain performance and its optimization.		
ACROSS ALL LEARNING OUTCOMES: - Able to function effectively as an individual, as a member or leader of diverse teams. - Recognize the need for lifelong learning and the ability to face it in the broader context of technological change.		
1° Del 17 al 23 de agosto	1.1) What is supply chain management 1.2) Objectives of supply chain management 1.3) Supply chain stages and roles 1.4) Physical and Platform supply chains	Presentation: Course Methodology and Assessment Guidelines Group Project #1 set Details on UE Virtual.
	Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 1 Págs. 1-27	
2° Del 24 al 30 de agosto	1.5) Supply Chain Design & Strategy 1.6) Supply Chain Integration – (Bullwhip LAB)	Activity: Lab session Beer/Soda game
	Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 1 Págs. 1-27	
	Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 13 Págs.559-590	
3° Del 31 de agosto al 06 de septiembre	1.7) Supply Chain Integration and Optimization 1.8) Understanding Supply Chain performance 1.9) The SCOR Model	Quiz N°1 Wisner Ch 1,13 & 14 and van Hoek (2001). E-supply chains – virtually non-existing Details on UE Virtual.
	Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 13 Págs.559-590	
	Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 14 Págs.601-624 van Hoek (2001). E-supply chains – virtually non-existing	
LEARNING UNIT II: DEMAND FORECASTING IN THE SUPPLY CHAIN		
LEARNING OUTCOME: - Apply and calculate different demand planning techniques, manufacturing strategies, inventory control and facility management systems transportation mix strategies, and location decision-making tools in the global context of the supply chain. - Create, select, and use modern engineering and information technology techniques, skills, resources, and tools, including prediction and modeling, with an understanding of their limitations. - The ability to apply knowledge of mathematics, science, and engineering to solve complex engineering problems.		
4° Del de 07 al 13 septiembre	2.1) Demand forecasting 2.2) Types of forecasting approaches 2.3) Quantitative forecasting models (LAB Session)	Activity: Lab Session Quantitative Forecasting Lab-Exercises
	Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 5 Págs. 173-200	

WEEK	CONTENTS	ACTIVITIES / EVALUATION
5° Del de 14 al 20 septiembre	2.4) Forecast accuracy 2.5) Recent developments in Forecasting Group Project #1 Presentations (2nd Session week 5) Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 5 Págs. 173-200	Group Project #1 due Upload presentation and report to UE Virtual on day of presentation Details on UE Virtual.
LEARNING UNIT III: SUPPLY ISSUES LEARNING OUTCOME: - Evaluate purchasing and sourcing decisions in terms of the benefits and risks. - Define and contrast the concepts of Ethical and Sustainable Supply Chains and the benefits for the organization and the needs of society		
6° Del de 21 al 27 septiembre	3.1) Sourcing decisions in the supply chain 3.2) Purchasing 3.3) Outsourcing 3.4) Total Cost of Ownership 3.5) Make or Buy decisions 3.6) Supplier relationships 3.7) Managing risk and availability 3.8) Supplier selection Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 2 Págs. 41-81 Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 3 Págs. 95-119	
7° Del de 28 septiembre al 04 octubre	3.9) Ethical sourcing 3.10) Sustainable sourcing 3.11) Supplier issues in Sustainable Supply Chains 3.12) Supplier Alliances Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 4 Págs.133-159 Sajjad et al (2015) Sustainable supply chain management motivators and barriers	Quiz #2: Wisner Ch 3, 4 & 5 and Sajjad et al (2015) Sustainable supply chain management motivators and barriers.pdf. Details on UE Virtual
LEARNING UNIT IV: OPERATIONS ISSUES LEARNING OUTCOME: - Apply and calculate different demand planning techniques, manufacturing strategies, inventory control and facility management systems transportation mix strategies, and location decision-making tools in the global context of the supply chain. - Create, select, and use modern engineering and information technology techniques, skills, resources, and tools, including prediction and modeling, with an understanding of their limitations. - The ability to apply knowledge of mathematics, science, and engineering to solve complex engineering problems.		
8° Del de 05 al 11 octubre	4.1) Resource planning in the Supply Chain 4.2) Aggregate planning in the Supply chain 4.3) Basic Chase and Level strategies 4.4) Chase and Level strategies with constraints (Backorder example) Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 5 th ed. Ch 6 Págs. 183-191	
9° Del 12 al 18 de octubre	4.5) Master Production Schedules 4.6) Available to Promise METHODS TEST in 2nd Session of Week 9 Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 5 th ed. Ch 6 Págs. 183-220	Methods test N° 1 Excel-based Calculation and Interpretation assessment taken in a Lab

WEEK	CONTENTS	ACTIVITIES / EVALUATION
10° Del de 19 al 25 octubre	4.4) Materials Requirements Planning 4.5) Bill of materials and Net requirements 4.6) Warehouse / Distribution facilities 4.7) Warehouse Centralization / Square Root Rule Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 5 th ed. Ch 6 Págs. 183-220	
11° Del de 26 octubre al 01 noviembre	4.11) Warehouse Management Systems (Warehouse LAB) 4.12) Managing Inventories 4.13) ABC Control method 4.14) ABC Inventory Matrix Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 9 Págs. 401-408	Activity: Lab session Warehouse Management simulation (FabLab)
12° Del de 02 al 08 noviembre	4.15) Inventory Management (ABC Inventory LAB) 4.16) Economic Order Quality Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 7 Págs. 271-307	Activity N° 4 ABC Inventory control LAB Simulation (FabLab) Quiz N° 3 Wisner Ch 6 & 7 and Helo & Hao (2022) Artificial intelligence in operations management and supply chain management.pdf
13° Del de 09 al 15 noviembre	4.17) Safety Inventory 4.18) Statistical reorder point 4.19) Probabilistic Safety Stock Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 7 Págs. 271-307 Helo & Hao (2022) Artificial intelligence in operations management and supply chain management	Group Project #2 set Details on UE Virtual.
LEARNING UNIT V DISTRIBUTION ISSUES LEARNING OUTCOME: - Apply and calculate different demand planning techniques, manufacturing strategies, inventory control and facility management systems transportation mix strategies, and location decision-making tools in the global context of the supply chain. - Create, select, and use modern engineering and information technology techniques, skills, resources, and tools, including prediction and modeling, with an understanding of their limitations. - The ability to apply knowledge of mathematics, science, and engineering to solve complex engineering problems.		
13° Del de 09 al 15 noviembre	5.1) Facility location 5.2) Location factors 5.3) Location decisions Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 11 Págs. 467-495 Frederico (2021) Towards a Supply Chain 4.0 on the post-COVID-19 pandemic	Quiz N° 4 Wisner Ch 9 & 11 and Frederico (2021) Towards a Supply Chain 4.0 on the post-COVID-19 pandemic.pdf Details on UE Virtual.
14° Del de 16 al 22 noviembre	5.4) Transportation in the supply chain 5.5) Transportation types and attributes 5.6) Global Logistics METHODS TEST 2nd Session of Week 14 Wisner/Tan/Leong. Principles of Supply Chain Management: A Balanced Approach 6 th ed. Ch 9 Págs. 381-423	Methods Test N° 2 Excel-based Integrated Calculation and Interpretation assessment conducted in Lab
15° Del de 23 al 29 noviembre	Group Project #2 Presentations 1st Session of Week 15 Invited Speaker: "Supply Chain Management in Action" OR Exam Preparation	Group Project #2 Due: Upload presentation and report to UE Virtual on day of presentation

16°

Del de 30
noviembre
al 06
diciembre

FINAL EXAM WEEK

VIII. Bibliography

Required Reading:

Selected Chapters

- Wisner, J.D., Tan, K-C., & Leong, G.K. (2022) **Principles of Supply Chain Management**, (6th Edition), Mason, OH: South-Western - Cengage Learning.

Additional Readings for Quizzes:

- Van Hoek, R. (2001). E-supply chains – virtually non-existing, *Supply Chain Management: An International Journal* (6)1, 21-28, <https://doi.org/10.1108/13598540110694653>
- Sajjad, A., Eweje, G., & Tappin, D. (2015). Sustainable supply chain management: motivators and barriers. *Business strategy and the environment*, 24(7), 643-655. <https://doi.org/10.1002/bse.1898>
- Helo, P. and Hao, Y. (2022). Artificial intelligence in operations management and supply chain management: an exploratory case study. *Production Planning & Control* (33)16, 1573–1590, <https://doi.org/10.1080/09537287.2021.1882690>
- Frederico, G.F. (2021). Towards a Supply Chain 4.0 on the post-COVID-19 pandemic. *Rajagiri Management Journal*, (15)2, 94-104, <https://doi.org/10.1108/RAMJ-08-2020-0047>

Ethical Expectations of Students

Use of AI and LLMs:

The Turnitin portal will be used for assessing poor academic practices including the use of AI for producing assignments. This portal detects plagiarism and AI production. If AI work is detected at high levels, the submission will come under greater scrutiny.

To avoid grade problems, use good AI ethics by declaring the use of AI in your projects by including an AI declaration stating how AI supported the production of the assignment, e.g., for basic research direction, finding key documents, finding a range of sources, outlining or formatting and translation. DO NOT rely on AI to provide your answers and simply reproduce these and represent it as your own work.

All written assignments are expected to be in your own words; however, AI may be used as a translation tool. Please recognize that AI translation assistance may impact the Turnitin score, so its declaration is required.

Formative evaluations such as quizzes are set to gauge the level of learning. Therefore, using AI to select quiz answers is considered to be learning avoidance. Rather, may use AI as a study tool to help you prepare for quizzes and to assist you to better understand the course content before taking quizzes.

Research:

While you may use and cite non-academic resources such as Wikipedia when working on assignments, you should not rely on them exclusively. Most of your theory-based sources should be peer-reviewed academic journals or chapter readings. Further, remember that you are responsible for the accuracy of any facts you present in your assignments and therefore should confirm the information you find from non-academic sources through further verification and triangulating sources.

IX. Lab Support

There are a number of Laboratory-Practical sessions for the course:

- A Bullwhip online simulation conducted in a computer lab,
- Quantitative forecasting models using MSeXcel conducted in a computer lab.
- Warehouse management and Inventory control simulations in the FabLab Warehouse LAB in weeks 11 and 12, and
- There are 2 Method Tests scheduled to be taken in a computer lab in weeks 9 and Week 14.

X. Instructors

Gareth Rees
Edgardo Jorge

grees@esan.edu.pe
ejorge@esan.edu.pe