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UNIVERSITAT POLITÈCNICA  
DE CATALUNYA  
BARCELONATECH

# **OPERATIONS AND SUPPLY CHAIN MANAGEMENT. TEACHING GUIDE 2023-2024**

## GENERAL DETAILS

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| <b>Name:</b>                             | Operations and Supply Chain Management                         |
| <b>Código:</b>                           | 801507   |
| <b>Curso:</b>                            | 2023-24  |
| <b>Titulación:</b>                       | Master Universitario en Administración y Dirección de Empresas |
| <b>Nº de créditos (ECTS):</b>            | 5  |
| <b>Requisitos:</b>                       | Sin requisitos previos   |
| <b>Ubicación en el plan de estudios:</b> | 2o cuatrimestre  |
| <b>Fecha de la última revisión:</b>      | Diciembre de 2023  |
| <b>Profesor Responsable:</b>             | Màrius Gil Mendoza   |
| <b>Nombre:</b>                           | Dirección de operaciones y supply chain management             |

## 1. GENERAL DESCRIPTION

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We are in a market for personalized services, globalized and with a high degree of uncertainty. The supply is much higher than the demand and this means that companies must compete in increasingly open, changing, innovative environments and with increasingly reduced margins.

In this subject area of Operations Management, we will study how to manage the operations of companies in the current context.

Managing uncertainty in logistics chains is one of the differentiating elements for the competitiveness of companies. The complex international networks of design, supply, production, transport, storage and distribution require an alignment of all the processes included in company operations.

The first part of this subject area offers an overview of Operations Management from the perspective of the evolution of the current market, marked by a high degree of uncertainty. In the second part, various philosophies (lean management, agile, exponential organizations) and management techniques are brought to light and worked on, offering students tools and techniques to make decisions in the different areas that are under the umbrella of Operations, aligned with the company's strategy.

In the third and last part, indicators for monitoring and control of operations are presented, as well as tools necessary for decision-making.

All methodologies will be presented using both real cases and simulations or games. The student will practice all the techniques explained in the sessions by studying the cases raised.

## 2. OBJECTIVES

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- To make the students aware of the vectors that determine the evolution of the current market, how to manage and make decisions in scenarios of uncertainty, how to align processes with the company's strategy and avoid local optimum.
- Show students the various approaches (lean, agile, exponential organizations) and techniques of operations management.
- Develop in students the ability to analyse scenarios and develop improvement and contingency plans.

## 3. CONTENTS

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### BLOCK 1. OPERATIONS GENERAL CONTEXT.

#### UNIT 1: RISK AND UNCERTAINTY IN THE CURRENT MARKET.

##### Learnings outcome

Students, after completing the chapter and doing the exercises, will be able to:

- Know the characteristics of the current context, environment characteristics and market needs. Understand the historical evolution of operations and select a strategy that adds value to the customer.
- Identify the value-added activities of a process. The student will learn the concept of waste and will know how to identify this waste in a process.
- Identify opportunities offered by exponential growth technologies in supply chain design (3D printing, etc.)

##### Contents

- 1.1 Current context of operations. The framework of abundance and exponential growth.
- 1.2 Customer: Waste and added value
- 1.3 Exercises and cases.

### BLOCK 2. OPERATIONS MANAGEMENT.

#### UNIT 2. Value chain management (lean supply chain).

##### Learning outcomes

After studying the chapter and completing the exercises, the student will learn about the various supply chain management philosophies and techniques:

- You will learn to use the VSM (Value Stream Mapping) methodology in the framework of a supply chain.
- You will have a methodology for the diagnosis of a supply chain and for the implementation of optimization actions.
- You will know and understand the supply chain's key parameters and indicators.

### Contents

- 2.1. The supply chain: design and optimization.
- 2.2. The future of supply chains.
- 2.3. Supply Chain Value Stream Mapping (VSM).
- 2.4. The robust supply chain (the resilient enterprise).
- 2.5. Exercises and cases (Toyota, Inditex and others).

### UNIT 3. PRODUCTION MANAGEMENT (LEAN MANAGEMENT).

#### Learning Outcomes

After studying the chapter and completing the exercises, the student will learn about the various supply chain management philosophies and techniques:

- You will know and understand the usefulness of PULL/QRM/JIT/PUSH management systems aimed at meeting customer needs.
- You will learn to use the VSM (Value Stream Mapping) methodology aimed at designing operations strategies.
- You will learn to use the key indicators for the control and monitoring of operations (OEE) and you will learn to use the methodologies that make it possible for you to improve results.

### Contents

- 3.1. Value Stream Mapping (VSM).
- 3.2. 'Lean' tools.
- 3.3. Indicators of improvement of effectiveness (OEE) and productivity.
- 3.4. Process design (Greenfield vs Brownfield).

### BLOCK 3. INFORMATION MANAGEMENT & DECISION MAKING.

### UNIT 4. EXECUTION OF OPERATIONS.

#### Learning Outcomes

Students, after studying the topics and doing the exercises, will be able to:

- Select a production model (MTO, MTS). Calculate the necessary stock level of a specific product in each phase of a production process.
- Select a production management and inventory analysis system according to the customer's needs (Flow, PFS, MRP, MTO).
- Understand the fundamentals of an MRP management system.

### Contents

- 4.1. Sales & Operations Plan (S&OP / MRP).
- 4.2. Stocks and warehouses management models.
- 4.3. Design of production and service capacity.
- 4.4. Exercises and cases.

### UNIT 5: DECISION MAKING.

#### Learning outcomes

Students, after completing the chapter and doing the exercises, will be able to:

- Diagnose and establish strategies aimed at optimizing processes.
- Identify the operations support tools (software). Identify common problems and causes of inefficiency in management systems.
- Develop problem solving dynamics in the face of unexpected situations.

### Contents

- 5.1. Dynamic behaviour of systems (Forrester effect).
- 5.2. Management routines - A3 dynamics.
- 5.3. Dynamics of problem resolution.
- 5.4. Exercises and cases.

## 4. TEACHING AND LEARNING METHODOLOGY

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The course has a clear orientation for presenting methodologies and management techniques that will be applied in practical cases or simulations during the face-to-face sessions. Students will be able to consolidate the learning of the concepts explained through exercises and complementary cases.

Students will carry out work in the classroom and at home, individually and in groups, and will make presentations in class that will allow them to establish knowledge, clarify doubts and debate points of view.

Exercises and cases presented by the lecturer will be worked on, as well as cases presented by students, based on their professional experience.

## 5. ASSESSMENT

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In accordance with the Bologna Plan, the model rewards the constant and continuous effort of the student body. For the 2020-21 academic year, 60% of the grade for the subject area is obtained from the continuous evaluation of the supervised activities and the remaining 40% from the face-to-face final exam. There is a notice for the final exam.

The final mark for the subject area (FM) will be calculated from the following formula:

- $FM = \text{Final Exam Mark} \times 40\% + \text{Continuous Assessment Mark} \times 60\%$
- Minimum mark of the final exam to calculate the FM will be 40 points out of 100.
- The subject area is passed with a FM equal to or greater than 50 points out of 100.

| Activity          | Block      | %    |            |
|-------------------|------------|------|------------|
| <b>Deliveries</b> |            |      | <b>30%</b> |
| Exercise          | Unit 3     | 33%  |            |
| Exercise          | Unit 4     | 33%  |            |
| Exercise          | Unit 5     | 34%  |            |
| <b>Test</b>       |            |      | <b>10%</b> |
| Test              | Test 1     | 20%  |            |
| Test              | Test 2     | 20%  |            |
| Test              | Test 3     | 20%  |            |
| Test              | Test 4     | 20%  |            |
| Test              | Test 5     | 20%  |            |
| <b>Final exam</b> |            |      | <b>60%</b> |
|                   | Final exam | 100% |            |

## 6. BIBLIOGRAPHY

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### 6.1 BASIC BIBLIOGRAPHY

The Toyota Way, Second Edition: 14 Management Principles from the World's Greatest Manufacturer. J.Liker, 2020

Designing and Managing the Supply Chain, David Simchi-Levi y otros, Mc Grau-Hill, Singapore, 2007

Exponential Organizations: Why new organizations are ten times better, faster, and cheaper than yours (and what to do about it), Salim Ismail & others, Diversion Publishing - IPS, 2016

## 6.2 COMPLEMENTARY BIBLIOGRAPHY

Supply chain and risk management. [https://www.pwc.com/gx/en/operations-consulting-services/pdf/pwc-and-the-mit-forum-for-supply-chain-innovation\\_making-the-right-risk-decisions-to-strengthen-operations-performance\\_st-13-0060.pdf](https://www.pwc.com/gx/en/operations-consulting-services/pdf/pwc-and-the-mit-forum-for-supply-chain-innovation_making-the-right-risk-decisions-to-strengthen-operations-performance_st-13-0060.pdf)

The Resilient Enterprise: Overcoming Vulnerability for Competitive Advantage, Yossi Sheffi, MIT Press, 2016

Lean Thinking: Banish Waste and Create Wealth in Your Corporation, Revised and Updated, J.Womack and D.Jones, 2003