Master in International Industrial Project Management
Subject: Operations Management in Industry

Credits: 6 ECTS (lecture 3 credits + practice 3 credits)

Language: English

Subject overview

This subject covers operations strategy, production process management, capacity and aggregate planning, MRP, short-term scheduling, TOC, supply chain management, lean practices, and sustainability. Students develop skills to design, optimize, and align industrial operations with strategic objectives in international and multicultural project environments.

Faculty

Pedro Sánchez Martín (psanchez@comillas.edu) *

Rubén Calvo Álvarez (rucalvo@gestamp.com)

Victoriano Conde Moro (vcmoro@icai.comillas.edu)

Carlos Tapia Arrate (carlos.tapia.arrate@gmail.com)

Ignacio Tornos de Inza (itornos@icai.comillas.edu)

* Coordinator

Course contents

Topic 1. Operations Strategy in Automotive Industry

- 1.1 Role of Operations in the Organization
  - 1.1.1 Strategic importance of operations
  - 1.1.2 Linking operations strategy to business strategy
- 1.2 Competitive Priorities
  - 1.2.1 Cost, quality, flexibility, speed, and innovation
  - 1.2.2 Trade-offs and strategic fit
- 1.3 Global Operations Strategy
  - 1.3.1 Global sourcing and location decisions
  - 1.3.2 Managing cultural and regulatory diversity

Topic 2. Strategy and Management of Production Processes

- 2.1 Process Strategy
  - 2.1.1 Process focus, repetitive focus, product focus, mass customization
  - 2.1.2 Choosing appropriate process types
- 2.2 Process Analysis and Design
  - 2.2.1 Flowcharting and process mapping
  - 2.2.2 Service blueprinting and layout strategies
- 2.3 Technology in Processes
  - 2.3.1 Automation and flexible manufacturing systems
  - 2.3.2 Integration with information systems

Topic 3. Capacity Planning, Aggregate Planning and MRP

- 3.1 Capacity Planning
  - 3.1.1 Design vs. effective capacity
  - 3.1.2 Capacity strategies
- 3.2 Aggregate Planning
  - 3.2.1 Demand and capacity options
  - 3.2.2 Mixed strategies and optimization methods
- 3.3 Material Requirements Planning (MRP)
  - 3.3.1 MRP inputs and outputs
  - 3.3.2 Master production scheduling and BOM explosion

Topic 4. Short-Term Programming, Theory of Constraints (TOC)

- 4.1 Short-Term Scheduling
  - 4.1.1 Scheduling objectives and sequencing rules
  - 4.1.2 Gantt charts and dispatch lists
- 4.2 Theory of Constraints
  - 4.2.1 Identifying system constraints
  - 4.2.2 Exploiting and elevating constraints
- 4.3 Just-in-Time and TOC Integration
  - 4.3.1 Drum-buffer-rope method
  - 4.3.2 Synchronizing production flows

Topic 5. Supply Chain Management

- 5.1 Supply Chain Strategy
  - 5.1.1 Supply chain design and integration

5.1.2 Bullwhip effect and risk management

5.2 Global Supply Chain

5.2.1 Outsourcing and offshoring decisions

5.2.2 Transportation, warehousing, and distribution

5.3 Coordination and Collaboration

5.3.1 Supplier relationship management

5.3.2 Collaborative planning, forecasting, and replenishment (CPFR)

Topic 6. Lean Management

6.1 Lean Principles

6.1.1 Value identification and value stream mapping

6.1.2 Pull systems and flow optimization

6.2 Waste Elimination

6.2.1 The seven wastes (muda)

6.2.2 Kaizen and continuous improvement

6.3 Lean Tools

6.3.1 5S methodology

6.3.2 Kanban and SMED

Topic 7. Sustainability

7.1 Sustainable Operations Strategy

7.1.1 Triple bottom line (people, planet, profit)

7.1.2 Regulatory and ethical considerations

7.2 Green Manufacturing

7.2.1 Resource efficiency and waste reduction

7.2.2 Circular economy and product lifecycle design

7.3 Sustainable Supply Chains

7.3.1 Sustainable sourcing and logistics

7.3.2 Carbon footprint measurement and reduction

Resources

- Teacher notes & slides.

Grading

The following conditions must be accomplished to pass the course:

- A minimum grade of 5 over 10.
- A minimum grade in the practice part of 5 over 10.
- A minimum overall grade of 5 over 10.

The overall grade is obtained as follows:

- Practice 50%
- Class Participation 30%
- Attendance 20%