

GENERAL INFORMATION

| Course information | |
|--------------------|--|
| Name | Operations Management |
| Code | DOI-MBA-611 |
| Degree | Máster en Ingeniería Industrial (MII), Máster en Ingeniería de Telecomunicación (MIT), Máster in Business Administration (MBA) |
| Year | 2 nd |
| Semester | 1 st (Fall) |
| ECTS credits | 6 ECTS |
| Type | Basic |
| Department | Industrial Management |
| Area | Manufacturing |
| Coordinator | Pedro Sánchez Martín |

| Instructor | |
|--------------|---------------------------------|
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DETAILED INFORMATION

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| Contextualization of the course |
| Contribution to the professional profile of the degree |
| <p>Operations management designs, operates, and improves productive systems—systems for getting work done. Operations managers work in banks, hospitals, factories or government. They design systems, produce products, ensure their quality and deliver services. To perform these activities, they work with customers and suppliers. They solve problems, reengineer processes, innovate and integrate to improve quality, speed-to-market, customization or lower cost. To get excellence in operations is critical to a firm's success.</p> <p>More specifically, the contributions of this course to the professional profile are the following:</p> <ul style="list-style-type: none"> • Gaining an appreciation of the strategic importance of operations and supply chain management in a global business environment and to understand how operations relates to other business functions. • Being able to describe the impact of operations and supply chain management on other functions within a firm, as well as on the competitive position of the firm. Being aware of the global nature of operations and the complexity of supply chains. • Developing a working knowledge of the concepts and methods related to designing and managing operations and to create value along the supply chain: The basic steps involved in bringing a product to market from its design through production and delivery. • Learning a skill set for continuous improvement: The ability to conceptualize how systems are interrelated, to organize activities effectively, to analyze processes critically, to make decisions based on data, and to push for continual process improvement. |
| Prerequisites |
| <p>There are no prerequisites to attend this course. However, it is recommended to be familiar with the basic issues, capabilities, and limitations of the operations function. For instance, these concepts are learned in the course "Manufacturing and Production" of the first course of Máster en Ingeniería Industrial (MII) and Máster en Ingeniería de Telecomunicación (MIT).</p> |

CONTENTS

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| Contents |
| Theory |
| Chapter 1. Introduction to Operations Management |
| 1.1 Operations Function on Global context 1.2 Strategy and Operations |
| Chapter 2. Quality Management |
| 2.1 Definition of Quality 2.2 Quality Tools 2.3 TQM & QMS 2.4 Six Sigma 2.5 The Cost of Quality and its effect on Productivity 2.6 ISO 9000 |
| Chapter 3. Inventory Management |
| 3.1 Role of Inventory 3.2 Elements of Inventory Management 3.3 Demand Forecasting 3.4 Inventory Control Systems 3.5 Inventory Models |
| Chapter 4. Supply Chain Management (SCM) |
| 4.1 The Management of Supply Chains 4.2 Green Supply Chain s- Sustainability 4.3 Distribution 4.4 Transportation 4.5 Information Technology: A Supply Chain Enabler 4.6 Supply Chain Integration 4.7 Measuring Supply Chain Performance |
| Chapter 5. Operations Planning |
| 5.1 Strategies for adjusting capacity 5.2 Aggregate Planning 5.3 Material Requirements Planning (MRP) 5.4 Scheduling 5.5 Capacity Requirements Planning (CRP) 5.6 Enterprise Resource Planning (ERP) |
| Chapter 6. Lean Systems |
| 6.1 Basic Elements of Lean Production 6.2 Elements of Lean Production 6.3 Lean Six Sigma 6.4 Value Stream Mapping |
| Practices |
| Practice 1. Quality Acceptance Tests |
| The student gets a real experience of how a proper quality acceptance test allows defect identification. By means of several individual samplings they can confirm if the tolerance level is properly designed and understand the risks associated. |
| Practice 2. Bullwhip Effect |
| The student gets a real experience of the impact of demand uncertainty on inventory levels, costs and |

supply quality along the supply chain layers with fixed delivery times

Practice 3. Sales & Operational Planning

The student by means of a role play can understand the different perspectives and interests each function brings to the monthly S&OP game plan where a consensus is needed.

Practice 4. Value Stream Mapping

In small groups the students must document, analyze and improve the flow of information or materials required to produce a simulated product for a customer.

Competences and Learning Outcomes

Competences

General Competences

- CG2. Manage data and information as key components to make decisions and identify, formulate and solve company problems
- CG 4. Implementation of Concepts and Theories of Companies to find new business opportunities obtaining long-term competitive advantages
- CG 6. Ethical Commitment at the enforcement of moral values and the ones of the company applied to ethical and corporate social responsibility dilemmas.
- CG 8. Critical thinking and argumentation consistent with the understanding of knowledge and the know-how of companies, their external context and their management practices
- CG 9. Autonomy to learn how to continue the process of enhancing the cognitive skills and the relevant knowledge applied to the professional and business activity.

Learning outcomes:

- RA 1. Interconnect concepts in a multilateral and transversely way
- RA 2. Identify the right concepts for each situation.
- RA 3. Determine the scope and usefulness of theoretical knowledge.
- RA 4. Assume of ethics and values associated to the performance of the professional career.
- RA 5. Pursue excellence in professional activities.
- RA 6. Assume a responsible attitude towards people, with the used means and resources.
- RA 7. Bear in mind the consequences that their activities and behaviours may affect to everyone else.
- RA 8. Identify, set and contrast hypothesis, variables and results in logical and critical way.
- RA 9. Review the options and alternatives with a critical thinking to allow discussion and argumentation of opposite opinions.
- RA Develop their assignments and tasks with initial instructions and a basic follow up
- RA Search and find appropriate resources to justify their activities and reports.
- RA Enlarge and deepen at the report development.

TEACHING METHODOLOGY

| General methodological aspects | |
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| <p>The best way of gaining a full understanding of Operations Management consists of showing and having real experiences on this topic. Consequently, all the proposed activities are focused on providing students real cases and practical experiences where implementation of operations management is essential for the improvement on company activities.</p> | |
| In-class activities | Competences |
| <ul style="list-style-type: none"> ▪ Lectures and problem-solving sessions (40 hours): The lecturer will introduce the fundamental concepts of each chapter, along with some practical recommendations, and will go through worked examples to support the explanation. Active participation will be encouraged by raising open questions to foster discussion and by proposing short application exercises to be solved in class. | CG4 |
| <ul style="list-style-type: none"> ▪ Case sessions (12 hours): Under the instructor's supervision, students, will apply the concepts and techniques covered in the lectures to real cases. | CG6, CG8, CG9 |
| <ul style="list-style-type: none"> ▪ Practice sessions (8 hours): Under the instructor's supervision, students, divided in small groups, will apply the concepts and techniques covered in the lectures to real problems. | CG9 |
| Out-of-class activities | Competences |
| <ul style="list-style-type: none"> ▪ Personal study of the course material and resolution of the proposed exercises (86 hours). | CG4, CG9 |
| <ul style="list-style-type: none"> ▪ Case session preparation to make the most of in-class time (28 hours). | CG6, CG8 |
| <ul style="list-style-type: none"> ▪ Practice session preparation to make the most of in-class time (6 hours). | CG9 |

ASSESSMENT AND GRADING CRITERIA

| Assessment activities | Grading criteria | Weight |
|---------------------------|--|--------|
| Mid-term exam | <ul style="list-style-type: none"> ▪ Understanding of the theoretical concepts. ▪ Application of these concepts to problem and case solving. ▪ Critical analysis of numerical exercises' results. | 15% |
| Final exam | <ul style="list-style-type: none"> ▪ Understanding of the theoretical concepts. ▪ Application of these concepts to problem and case solving. ▪ Critical analysis of numerical exercises' results. | 40% |
| Business case Discussion | <ul style="list-style-type: none"> ▪ Class participation. ▪ Test Results (Pre-and post-discussion in class). | 15% |
| Business case Preparation | <ul style="list-style-type: none"> ▪ Case preparation ▪ On class presentation | 15% |
| Practice Test | <ul style="list-style-type: none"> ▪ Class participation. ▪ Test Results (Pre-and post-practice). | 15% |

GRADING AND COURSE RULES

| Grading |
|--|
| Regular assessment |
| <ul style="list-style-type: none"> ▪ Exams will account for 55%, of which: <ul style="list-style-type: none"> • Mid-term: 15% • Final exam: 40% • The <i>Exam global mark</i> is computed weighting proportionally each exam. ▪ Cases and practices will account for the remaining 45%, of which: <ul style="list-style-type: none"> • Business Cases: 30% • Practices: 15% <p>In case that the <i>exam global mark</i> is equal or lower than 3.5, the final grade will be the <i>exam global mark</i>. Otherwise, the final grade is computed weighting the different marks as the previously shown percentages. To pass the course, the final grade should be greater or equal to 5.0.</p> |
| Retakes |
| <p>Cases and practice marks will be preserved. The resulting grade will be computed as follows:</p> <ul style="list-style-type: none"> ▪ Final exam: 55% ▪ Cases: 30% ▪ Practices: 15% <p>In case that the final exam mark is equal or lower than 3.5, the final grade will be the final exam mark. Otherwise, the final grade is computed weighting the different marks as the previously shown percentages. To pass the course, the final grade should be greater or equal to 5.0.</p> |
| Course rules |

- Class attendance is mandatory according to Article 93 of the General Regulations (Reglamento General) of Comillas Pontifical University and Article 6 of the Academic Rules (Normas Academicas) of the ICAI School of Engineering. Not complying with this requirement may have the following consequences:
 - Students who fail to attend more than 15% of the lectures may be denied the right to take the final exam during the regular assessment period.

Students who commit an irregularity in any graded activity will receive a mark of zero in the activity and disciplinary procedure will follow (cf. Article 168 of the General Regulations (Reglamento General) of Comillas Pontifical University).

WORK PLAN AND SCHEDULE¹

| In and out-of-class activities | Date/Periodicity |
|---|---|
| Mid-term exam | Week 7 (14 th to 18 th Oct) |
| Final exam | December (10 th to 20 th) |
| Practice sessions | Weeks 4, 6 and 11 and 14 (Approx.) |
| Review and self-study of the concepts covered in the lectures | After each chapter |
| Problem-solving | After each chapter that contents problem solving |
| Practice output analysis (Test when required) | Just right after every practice |
| Final exam preparation | December |

| STUDENT WORK-TIME SUMMARY | | | |
|---------------------------|---------------------|---------------------------------|----------------------|
| IN-CLASS HOURS | | | |
| Lectures | Problem-solving | Case sessions | Practices |
| 38 | 2 | 12 | 8 |
| OUT-OF-CLASS HOURS | | | |
| Self-study | Problem preparation | Case preparation and evaluation | Practice |
| 82 | 4 | 24 | 8 |
| ECTS credits: | | | 6 (180 hours) |

¹ A detailed work plan of the subject can be found in the course summary sheet (see following page). Nevertheless, this schedule is tentative and may vary to accommodate the rhythm of the class.

BIBLIOGRAPHY

Basic bibliography

- Notes and slides prepared by lecturers (available in Moodle).
- R.S. Russell y B. W. Taylor. Operations Management. Creating Value Along the Supply Chain. (7ª ed.). John Wiley & Sons, Inc.. Estados Unidos (2011).

Complementary bibliography

- F. R. Jacobs and R.B. Chase, Operations and Supply Chain Management, 13th Edition. New York, McGraw Hill, 2011.
- J. Heizer y B. Render. Dirección de la Producción y de Operaciones. Tomo I: Decisiones estratégicas Tomo II: Decisiones tácticas. (11ªed.). Pearson. España (2015).
- L. J. Krajewski, L.P. Ritzman y M. K. Malhotra. Administración de operaciones. Procesos y cadena de suministro. (10ªed.). Pearson. Mexico (2013).
- J. Mangan, C. Lalwani y T. Butcher. Global Logistics and Supply Chain Management (1ªed.). John Wiley & Sons. Great Britain (2008).
- P.P. Dornier, R. Ernst, M. Fender y P. Kouvelis. Global Operations and Logistics. Text and Cases (1ªed.). John Wiley & Sons. Estados Unidos (1998).

| | IN-CLASS ACTIVITIES | | | | OUT-OF-CLASS ACTIVITIES | | | | LEARNING OUTCOMES |
|------|---------------------|--|----------------------------------|--------------------|-------------------------|--|-------------------------------|---|---------------------------------|
| Week | h/w | LECTURE & PROBLEM SOLVING | LAB | ASSEMENT | h/w | SELF-STUDY | LAB PREPARATION AND REPORTING | OTHER ACTIVITIES | Learning Outcomes |
| 1 | 4 | Course presentation (1h) and Chapter 1. Introduction to Operations Management (2h); one case of Chapter 1 (1h) | | Case | 5 | Review and self-study (4h) | | Tests: Post case discussion (1h) | RA1, RA3 |
| 2 | 4 | Chapter 1. Introduction to Operations Management (1h) and one case of Chapter 1 (1h) Chapter 2. Quality Management (2h) | | Case | 7 | Review, self-study and case-solving (6h) | | Tests: Post case discussion (1h) | RA2, RA3, RA4, RA5 |
| 3 | 4 | Chapter 2. Quality Management (3h) One case of Chapter 2 (1h) | | Case | 7 | Review, self-study and problem-solving (6h) | | Tests: Post case discussion (1h) | RA2, RA3, RA4, RA5 |
| 4 | 4 | One case of Chapter 2 (1h) Chapter 3. Inventory Management (1h) | Practice 1. Sampling Test (2h) | Test of Practice 1 | 6 | Review and self-study (2h) | Practice preparation (2h) | Tests: Post practice (1h) Tests: Post case discussion (1h) | RA4, RA6, RA7, RA10 |
| 5 | 4 | Chapter 3. Inventory Management (3h), one case of Chapter 3 (1h) | | Case | 7 | Review, self-study and case-solving (6h) | | Tests: Post practice (1h) | RA4, RA6, RA7, RA10, RA11, RA12 |
| 6 | 4 | Chapter 3. Inventory Management (1h), one case of Chapter 3 (1h) | Practice 2. Bullwhip Effect (2h) | Test of Practice 2 | 6 | Review, self-study and case-solving (2h) | Practice preparation (2h) | Tests: Post practice (1h) Tests: Post case discussion (1h) | RA7, RA8, RA9 |
| 7 | 4 | Chapter 4. Supply Chain Management (1h) and one case of Chapter 4 (1h) | | Mid-term exam (2h) | 7 | Review, self-study and problem-solving (10h) | | Tests: Post case discussion (1h) | RA4, RA6, RA7, RA10, RA11, RA12 |
| 8 | 4 | Chapter 4. Supply Chain Management (3h) and one case of Chapter 4 (1h) | | Case | 11 | Review, self-study and problem-solving (6h) | | Tests: Post case discussion (1h) | RA12 |
| 9 | 4 | Chapter 4. Supply Chain Management (1h) and one case of Chapter 4 (1h), Chapter 5. Operations Planning (1h), one case of Chapter 5 (1h) | | Case | 6 | Review, self-study and problem-solving (4h) | | Tests: Post case discussion (2h) | RA4, RA7, RA8 |
| 10 | 4 | Chapter 5. Operations Planning (2h), problems of Chapter 5 (2h) | | Problems | 8 | Review, self-study and problem-solving (8h) | | | RA4, RA7, RA8 |

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| 11 | 4 | Chapter 6. Lean Systems (1h), one case of chapter 6 (1h) | Practice 3. Sales & Operational Planning (2h) | Test of Practice 3 | 7 | Review, self-study and case-solving (4h) | Practice preparation (2h) | Tests: Post practice (1h) | RA4, RA6, RA7, RA10, RA11, RA12 |
| 12 | 4 | Chapter 6. Lean Systems (3h), one case of chapter 6 (1h) | | Case | 7 | Review, self-study and case-solving (6h) | | Tests: Post case discussion (1h) | RA5, RA9 |
| 13 | 4 | Chapter 6. Lean Systems (3h), one case of chapter 6 (1h) | | Case | 7 | Review, self-study and case-solving (6h) | | Tests: Post case discussion (1h) | RA4, RA5, RA6, RA7, RA9, RA10, RA11, RA12 |
| 14 | 4 | Chapter 6. Lean Systems (1h), one case of chapter 6 (1h) | Practice 4. Value Stream Mapping (2h) | Test of Practice 4 | 3 | Review, self-study and case-solving (4h) | Practice preparation (2h) | Tests: Post practice (1h) | RA5, RA9 |
| 15 | 4 | Lecture by a specialist (2h). Course Review (2h) | | | 4 | Review, self-study (4h) | | | RA5, RA9 |