**Course guide**

820014 - OP - Production Organisation

Unit in charge: Barcelona East School of Engineering  
Teaching unit: 732 - OE - Department of Management.

Degree:  
- BACHELOR’S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009), (Compulsory subject).
- BACHELOR’S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009), (Compulsory subject).
- BACHELOR’S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009), (Compulsory subject).
- BACHELOR’S DEGREE IN ENERGY ENGINEERING (Syllabus 2009), (Compulsory subject).
- BACHELOR’S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009), (Compulsory subject).
- BACHELOR’S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009), (Compulsory subject).
- BACHELOR’S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010), (Compulsory subject).

Academic year: 2023  
ECTS Credits: 6.0  
Languages: Catalan, Spanish

**LECTURER**

Coordinating lecturer: Doménech Léga, Bruno

Others:  
Primera quadrimestre:  
- DAVID AGUSTIN RIPOLL - Grup: M11, Grup: M12  
- XAVIER GRÈBOL NOGUERAS - Grup: T11, Grup: T12  
- RUBÉN MARTÍN TORT - Grup: T21, Grup: T22  
- RAFAEL PASTOR MORENO - Grup: M11, Grup: M12, Grup: M21, Grup: M22  
- GEMMA ROS ESCODA - Grup: M31, Grup: M32

Segona quadrimestre:  
- DAVID AGUSTIN RIPOLL - Grup: M11, Grup: M12, Grup: M31, Grup: M32  
- ERNESTO GARRIDO GODES - Grup: M11, Grup: M12, Grup: M21, Grup: M22  
- XAVIER GRÈBOL NOGUERAS - Grup: T11, Grup: T12  
- RUBÉN MARTÍN TORT - Grup: T21, Grup: T22  
- GEMMA ROS ESCODA - Grup: M21, Grup: M22, Grup: M31, Grup: M32

**DEGREE COMPETENCES TO WHICH THE SUBJECT CONtributes**

**Specific:**
4. Understand the applications of business organisation.
5. Understand the basics of production and manufacturing systems.

**Transversal:**
2. ENTREPRENEURSHIP AND INNOVATION - Level 2. Taking initiatives that give rise to opportunities and to new products and solutions, doing so with a vision of process implementation and market understanding, and involving others in projects that have to be carried out.

**TEACHING METHODOLOGY**

The course has 4 different typologies of sessions along the semester:
- Theory: explanation of the theoretical concepts and resolution of small practical examples (20% of the time)
- Problems: resolution in group of practical exercises to deepen on the theoretical concepts (10% of the time)
- Laboratory: resolution of mathematical models using specialised software (10% of the time)
- Selflearning: guided activities as well as personal and non-in-person study (60% of the time)
LEARNING OBJECTIVES OF THE SUBJECT

Show the main ideas of production, its relationship with the logistics area and other management elements of the enterprise
Give to the students the idea of the importance of decision making when managing logistic and production systems.
Prepare the student to different techniques to schedule and control activities.
Prepare the student to solve fuzzy problems.
Teach the student qualitative techniques applicable to the solution of management problems

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>30.00</td>
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</tbody>
</table>

**Total learning time:** 150 h

CONTENTS

**Introduction**

**Description:**
Concept of production and productive system. Typologies of productive systems. Typology of decisions in production management. Concept and classifications of costs. Criteria for the evaluation and selection of investments.

**Related competencies:**
CEI-17. Understand the applications of business organisation.

**Full-or-part-time:** 10h
Theory classes: 4h
Self study : 6h

**Location and distribution**

**Description:**

**Related competencies:**
CEI-15. Understand the basics of production and manufacturing systems.

**Full-or-part-time:** 15h
Theory classes: 6h
Self study : 9h
<table>
<thead>
<tr>
<th><strong>Scheduling</strong></th>
<th></th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Characteristics and elements of programming problems. Typologies of bounds: potential, cumulative and disjunctive. Jshop and flowshop problems.</td>
</tr>
<tr>
<td><strong>Related competencies:</strong></td>
<td>CEI-15. Understand the basics of production and manufacturing systems.</td>
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<tr>
<td><strong>Full-or-part-time:</strong></td>
<td>30h</td>
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<tr>
<td></td>
<td>Theory classes: 12h</td>
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<td></td>
<td>Self study : 18h</td>
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<thead>
<tr>
<th><strong>Production Planning</strong></th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Concept of operations planning. Characteristics of a plan, horizon, frequency, robustness, degree of detail. Master plan, intuitive methods, Bowman model, linear models, models based on graphs theory.</td>
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<tr>
<td><strong>Related competencies:</strong></td>
<td>CEI-15. Understand the basics of production and manufacturing systems.</td>
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<tr>
<td><strong>Full-or-part-time:</strong></td>
<td>25h</td>
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<tr>
<td></td>
<td>Theory classes: 10h</td>
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<tr>
<td></td>
<td>Self study : 15h</td>
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<thead>
<tr>
<th><strong>Inventory management for independent demand</strong></th>
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<tr>
<td><strong>Related competencies:</strong></td>
<td>CEI-15. Understand the basics of production and manufacturing systems.</td>
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<tr>
<td><strong>Full-or-part-time:</strong></td>
<td>35h</td>
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<tr>
<td></td>
<td>Theory classes: 14h</td>
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<td></td>
<td>Self study : 21h</td>
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<tr>
<th><strong>Inventory Management for Dependent Demand</strong></th>
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<tr>
<td><strong>Description:</strong></td>
<td>Structure of the product, list of materials, matrix-based and iterative procedures. MRP I. Planning of production resources.</td>
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<tr>
<td><strong>Related competencies:</strong></td>
<td>CEI-15. Understand the basics of production and manufacturing systems.</td>
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<tr>
<td><strong>Full-or-part-time:</strong></td>
<td>10h</td>
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<tr>
<td></td>
<td>Theory classes: 4h</td>
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<td>Self study : 6h</td>
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Mathematical modelling

Description:
System modelling using mathematical programming. Establishment of variables, constraints and objective. Differences between modelling and solving. Linear Programming and Integer Linear Programming.

Specific objectives:
To provide students with tools for modelling and solving problems. To provide students with the skills to differentiate between data and variables, costs and solutions, objective functions and constraints. To provide the tools to allow a student to obtain linear equivalents to nonlinear problems.

Related competencies:
01 EIN N2. ENTREPRENEURSHIP AND INNOVATION - Level 2. Taking initiatives that give rise to opportunities and to new products and solutions, doing so with a vision of process implementation and market understanding, and involving others in projects that have to be carried out.

Full-or-part-time: 20h
Practical classes: 10h
Self study: 10h

GRADING SYSTEM

The final mark of the course is calculated as follows:

\[ NF = \max\{NF1; NF2\} \]

\[ NF1 = 0,45 \cdot EF + 0,25 \cdot EP + 0,15 \cdot EL + 0,1 \cdot ACT + 0,05 \cdot ACL \]
\[ NF2 = 0,45 \cdot EF + 0,35 \cdot EP + 0,2 \cdot EL \]

\[ EF = \text{mark of the final examen} \]
\[ EP = \text{mark of the mid-term exam} \]
\[ EL = \text{mark of the laboratory exam} \]
\[ ACT = \text{mark of the activities of continuous evaluation of theory} \]
\[ ACL = \text{mark of the activities of continuous evaluation of laboratory} \]

In case of failing, a reevaluation exam can be carried out, which allows recovering 80% of the course (the mark of the laboratory exam, EL and ACL, is excluded). Students can attend the reevaluation exam if they accomplish the requirements defined by the EEBE in the Assessment and Permanence Regulations.

BIBLIOGRAPHY

Basic:

Complementary: