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: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Doménech Léga, Bruno
Others: Agustín Ripoll, David
         Doménech Léga, Bruno
         Garrido Godes, Ernesto
         Grévol Nogueras, Xavier
         Martín Tort, Rubén
         Pastor Moreno, Rafael
         Ros Escoda, Gemma

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

Scheduling

Description:

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

Full-or-part-time: 30h
Theory classes: 12h
Self study: 18h
### Production Planning

**Description:**
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.

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

**Full-or-part-time:** 25h  
Theory classes: 10h  
Self study : 15h

### Inventory management for independent demand

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

**Full-or-part-time:** 35h  
Theory classes: 14h  
Self study : 21h

### Inventory Management for Dependent Demand

**Description:**
Structure of the product, list of materials, matrix-based and iterative procedures. MRP I. Planning of production resources.

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

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

### 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 equivalences 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:

\[ NF = \max\{NF_1; NF_2\} \]

\[ NF_1 = 0.45 \cdot EF + 0.25 \cdot EP + 0.15 \cdot EL + 0.1 \cdot ACT + 0.05 \cdot ACL \]
\[ NF_2 = 0.45 \cdot EF + 0.35 \cdot EP + 0.2 \cdot EL \]

\( EF \) = mark of the final examen
\( EP \) = mark of the mid-term exam
\( EL \) = mark of the laboratory exam
\( ACT \) = mark of the activities of continuous evaluation of theory
\( ACL \) = 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: