Course guides
820014 - OP - Production Organisation

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

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

Academic year: 2020 ECTS Credits: 6.0 Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: BRUNO DOMÉNECH LÉGA

Others:
Primer quadrimestre:
BRUNO DOMÉNECH LÉGA - M11, M12
ERNESTO GARRIDO GODES - M12, M22, M32
XAVIER GRÉBOL NOGUERAS - T11, T12, T21
RUBÉN MARTÍN TORT - T12, T21, T22
RAFAEL PASTOR MORENO - M21, M22, M31, M32
GEMMA ROS ESCODA - M11, M12, M21, M22, M31, M32

Segon quadrimestre:
ERNESTO GARRIDO GODES - M21, M22
XAVIER GRÉBOL NOGUERAS - T11, T12, T21
MARC JUANPERA GALLEL - M12, M22
RUBÉN MARTÍN TORT - T12, T21, T22
GEMMA ROS ESCODA - M11, M12, M21, M22

PRIOR SKILLS

None.

REQUIREMENTS

None.

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 activitites.
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>
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<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
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:

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

\[ NF1 = 0,5 \cdot EF + 0,2 \cdot EP + 0,2 \cdot PL + 0,1 \cdot AC \]
\[ NF2 = 0,6 \cdot EF + 0,2 \cdot EP + 0,2 \cdot PL \]

EF = mark of the final examen
EP = mark of the mid-term exam
PL = mark of the laboratory evaluation
AC = mark of the activities of continuous evaluation

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, is excluded). In order to be allowed to do such an exam, the global mark on the recorded part must not be lower than 3. The students will be able to access the re-assessment test that meets the requirements set by the EEBE in its Assessment and Permanence Regulations (https://eebe.upc.edu/ca/estudis/normatives-academiques/documents/eebe-normativa-avaluacio-i-permanencia-18-19-aprovat-je-2018-06-13.pdf)

BIBLIOGRAPHY
Basic:

Complementary:
- Heizer, Jay H. [et al.]. Dirección de la producción y de operaciones : decisiones estratégicas [on line]. Madrid [etc.]: Prentice Hall,