820014 - OP - Production Organisation

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 732 - OE - Department of Management
Academic year: 2019
Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Teaching unit Compulsory) BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory) BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)

ECTS credits: 6

Teaching languages: Catalan, Spanish

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

Opening hours
Timetable: To be arranged by email.

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)
- Self-learning: 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 quantitative techniques applicable to the solution of management problems

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>Hours medium group:</th>
<th>Hours small group:</th>
<th>Guided activities:</th>
<th>Self study:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45h</td>
<td>0h</td>
<td>15h</td>
<td>0h</td>
<td>90h</td>
</tr>
</tbody>
</table>
**Content**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>10h</td>
<td>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.</td>
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<tr>
<td><strong>Scheduling</strong></td>
<td>30h</td>
<td>Characteristics and elements of programming problems. Typologies of bounds: potential, cumulative and disjunctive. Joshop and flowshop problems.</td>
</tr>
<tr>
<td><strong>Inventory managment for independent demand</strong></td>
<td>35h</td>
<td></td>
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<tr>
<td><strong>Production Planning</strong></td>
<td>25h</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>
</tr>
</tbody>
</table>
The final mark of the course is calculated as follows:

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

\[ NF_1 = 0.5 \cdot EF + 0.2 \cdot EP + 0.2 \cdot PL + 0.1 \cdot AC \]
\[ NF_2 = 0.6 \cdot EF + 0.2 \cdot EP + 0.2 \cdot PL \]

**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.
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Bibliography

Basic:


Complementary:


