240I0I21 - Operations Management

Degree competences to which the subject contributes

Specific:
- CEMEI09. Knowledge and abilities to organise and manage companies.

CEMEI13. Knowledge in information systems for the management, industrial organization, production systems and logistics and quality management systems.

Teaching methodology

The course consists of the following training activities:
* Theoretical sessions. A part of these sessions corresponds to a master class (lectures). And the rest is devoted to participatory-guided classes.
* Practical sessions. They correspond to a laboratory class where the students in groups of 3 or 4 apply quantitative tools in order to understand how to apply the procedures introduced in lectures.
* This is complemented by self study and a business case; both are distance learning.
* Finally, we consider the evaluation activities (mid-term exam, exam on practical exercises and final exam).

Learning objectives of the subject

We study the decisions associated with the management of manufacturing and logistic systems (short-term management). It presents the conceptual framework, the basic principles and some specific elements in depth: planning, finite capacity scheduling, inventory management, etc. We will analyse the major problems that occur in the management of a production and logistic system, as well as methods and tools to solve them.

After completing the course, students must:
* Know the basic scheme of decision making in the short term (operations management) and place the problems there.
* Address some common choices on management systems (inventory, planning and scheduling, among others).
* Apply methodologies for solving problems of project management with economic issues.
* Determine the policy of inventory management, according to internal and external conditions.
* Perform aggregation and disaggregation and apply models for planning to real cases.
* Develop operations scheduling in complex systems of production and distribution.
* Use tools to extract quantitative conclusions in planning, scheduling ...
# Study load

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Hours large group: 27h</th>
<th>24.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group:</td>
<td>13h 30m</td>
<td>12.00%</td>
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<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td>Self study:</td>
<td>72h</td>
<td>64.00%</td>
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# 240IOI21 - Operations Management

## Content

| 1. Introduction | Learning time: 3h  
Practical classes: 1h 30m  
Laboratory classes: 1h 30m |
<table>
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<tr>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Integrated logistics system. Reference model of Operations Management. Relationship with other functions. Views of operations management in production.</td>
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</tbody>
</table>
| **Related activities:** | Theoretical lecture.  
Short-duration activities. |
| **Specific objectives:** | Place each of the decisions related to operations management in production and logistics systems. Classify the elements and the costs involved in a management decision. |

| 2. Inventory management | Learning time: 12h  
Practical classes: 7h 30m  
Laboratory classes: 4h 30m |
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Review of models of deterministic demand, both homogeneous. Economic Order Quantity, and with production. Random demand. Models for inventory management: fixed order quantity model or fixed time period model, considering stockout cost and service quality. Application to different demand distributions: discrete, Poisson, normal, exponential. Multiple products in a single delivery. Supply chain management.</td>
</tr>
</tbody>
</table>
| **Related activities:** | Theoretical lecture.  
Short-duration activities.  
Exercises. |
| **Specific objectives:** | Understand the information given in a situation of random inventory management. Determine the values of the variables used in the considered management model: fixed order quantity or fixed time period. Manage the inventory policies according to the given indicators of service quality. |
### 3. Operations planning

**Description:**
Review the basics of planning. Aggregation and disaggregation. Modularity, constraints and inhibitions. Classification for linear models in planning. Models for aggregate planning based on the Bowman's model. Mathematical models with hiring and firing, distribution, several levels of production ...

**Related activities:**
Theoretical lecture. Short-duration activities. Exercises.

**Specific objectives:**
Use a basic planning model to face a real or inspired by the reality situation. Determine the Detailed Master Plan from the Aggregate Master Plan following a formalized procedure.

### 4. Scheduling

**Description:**

**Related activities:**
Theoretical lecture. Short-duration activities. Exercises.

**Specific objectives:**
Determine the kind/s of flow in a given production system. Get a solution for a hybrid flow-shop, parallel machines or similar problems. Get a solution for a distribution problem, considering inventory or not.
The evaluation is done by several methods:

1. a final exam (EF), with a maximum of three hours duration, consisting of several theoretical and practical exercises in which the student must demonstrate the ability to apply learned knowledge and to develop specific procedures of resolution;

2. a mid-term exam (PP), with a maximum of 1h15' duration, in which the student is basically faced to intellectual agility questions and short exercises;

3. an exam about exercises (EP), with a maximum of 1 hour duration, in which the student must demonstrate that he/she is able to solve situations slightly different from those worked out in class;

4. evaluation during practical sessions (TP), in which the student must demonstrate his/her progressive learning during practical sessions;

5. a business case (BC), in which the student must show how concepts are applied in the simulation of a real case and learn teamwork;

6. activities in theory lessons (AT), which are a maximum of 4 activities that may add 1 additional point totally to the final exam evaluation.

The final grade for the course Nfinal will be obtained:

$$N_{\text{final}} = 0.6 \cdot N_{\text{af}} + 0.2 \cdot N_{\text{ep}} + 0.2 \cdot N_{\text{ac}}$$

Where:

- $N_{\text{af}}$: final exam evaluation
- $N_{\text{ep}}$: practical sessions evaluation
- $N_{\text{ac}}$: progressive learning evaluation

The learning time for the module is 4h 30m, including:
- Practical classes: 3h
- Laboratory classes: 1h 30m
Regulations for carrying out activities

The final exam (EF), the mid-term exam (PP) and the exam about exercises (EP) are open books. Electronic devices are not allowed, except pocket calculator (mobile phone or any other devices are not allowed). The evaluation during practical sessions (TP) will be held answering the requested questions, during each session. Business case (BC) will begin mandatorily in a practical session and the requested decisions will be given on-line, according to the dates given at the beginning of the course. For the activities in theory lessons (AT), their dates will not be given in advance and the asked questions will be answered in the corresponding theoretical sessions.

If the student attends the re-evaluation exam of the subject (REA), this mark will replace that in the final examination (EF). The re-evaluation exam may be a multiple-choice test.

Bibliography

Basic:


Complementary:


Others resources:

Audiovisual material

Transparencies de teoria

Slides for lectures

Enunciats de pràctiques

Description of the exercises