250ST2122 - Transport of Goods

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering
Academic year: 2017
Degree: MASTER’S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
MASTER’S DEGREE IN SUPPLY CHAINS, TRANSPORT AND MOBILITY (Syllabus 2014). (Teaching unit Optional)
MASTER’S DEGREE IN STATISTICS AND OPERATIONS RESEARCH (Syllabus 2013). (Teaching unit Optional)
ECTS credits: 5
Teaching languages: English

Teaching staff
Coordinator: Miquel Estrada
Others: M. Paz Linares, José Magín Campos, Francesc Robusté

Opening hours
Timetable: Wednesdays from 16 to 18. Previous request via email

Degree competences to which the subject contributes

Specific:
CESCTM4. Know and apply the modeling techniques and simulation optimization to solve the problems of design, operation and management of transportation systems.

Teaching methodology

The course approach will be based on a blending of theoretical concepts and practical issues. Theoretical concepts and practical guidelines will be the main contents of the two hours weekly lectures. Selected comprehensive collections of papers dealing with the main issues will be supplied to the students along with practical exercises that will provide a better understanding of the theoretical issues. The students will have to do a small project and individual exercises during the course.

Learning objectives of the subject

Vertical contents: Freight transportation planning and management principles and applications.
Transversal concepts: Economic and Social Territory, City and Regional Planning, Sustainability, Environment, Routing, Scheduling, Energy, trade-off Supply vs Demand, trade-off Global vs Local, Functionality, Transportation System Management, etc.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 0h 0.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group: 30h 24.00%</td>
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<td></td>
<td>Hours small group: 15h 12.00%</td>
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<td>Guided activities: 0h 0.00%</td>
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<td>Self study: 80h 64.00%</td>
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## 1. Transportation system overview

**Description:**
Transportation system overview. Objectives, planning, stakeholders, nature of freight, regulation, types of companies and services, atomization, logistics operators, LPI (WB).

**Learning time:** 2h
- Theory classes: 2h

## 2. Distribution system design

**Description:**
Distribution system design. Elements, costs, network typology (hub-and-spoke, peddling, direct shipments), trade-offs.

**Learning time:** 4h
- Theory classes: 4h

## 3. Transportation problems

**Description:**

**Learning time:** 2h
- Theory classes: 2h

## 4. Classic Transportation Problems

**Description:**
Classic Transportation Problems (II). Location models.

**Learning time:** 2h
- Theory classes: 2h

## 3. Classic Transportation Problems (III). Routing and scheduling problems

**Description:**
Classic Transportation Problems (III). Routing and scheduling problems.

**Learning time:** 2h
- Theory classes: 2h
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<table>
<thead>
<tr>
<th>Section</th>
<th>Learning time</th>
<th>Description</th>
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| **8. Urban freight transportation**                         |               | **Learning time:** 6h  
Theory classes: 6h  
**Description:** Urban freight transportation. City logistics, particularities, smart and green measures. |
| **10. Simulation of urban freight distribution**             |               | **Learning time:** 2h  
Theory classes: 2h  
**Description:** Simulation of urban freight distribution                                                                 |
| **7. Logistics centers and freight terminals**               |               | **Learning time:** 2h  
Theory classes: 2h  
**Description:** Logistics centers and freight terminals. Market analysis, services supply, competition, location, accessibility, functional layout, city planning and urbanization, economics, promotion. Two-echelon problems |
| **6. Long-haul freight transportation**                     |               | **Learning time:** 4h  
Theory classes: 4h  
| **11. Pricing and rating**                                  |               | **Learning time:** 2h  
Theory classes: 2h  
**Description:** Pricing and Rating. Monopoly market, perfect competition, fare structure, profits, demand elasticity. Revenue Management and Capacity Planning |
It will be based on the small project and individual exercises assigned to each student. 2 Exams (E1+E2)+ Projecte (P).
Nota= 0.35E1+0.35E2+0.3 P

Bibliography

Basic:


Complementary:


Others resources:

ATENEA:  
- Planning of the subject.  
- Notes related to block contents.  
- Slides presented in weekly lectures.  
- Collection of papers dealing with the main issues.  
- Guidelines for the individual practices.  
- Tasks related to assignments.