250ST022 - Demand of Transportation Systems

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering
Academic year: 2018
Degree: MASTER'S DEGREE IN SUPPLY CHAIN, TRANSPORT AND MOBILITY MANAGEMENT (Syllabus 2014). (Teaching unit Compulsory)
MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
ECTS credits: 5
Teaching languages: English

Teaching staff
Coordinator: Lidia Montero Mercadé
Others: FRANCESC ROBUSTÉ ANTÓN

Prior skills
Students must have sufficient knowledge of algebra and mathematical analysis in order to assimilate concepts regarding probability, univariant distribution of random variates, numerical series, matrix algebra, functions of real variables in one or more dimensions, derivation and integration.
Student must have basic programming skills in pseudocode or in a high level programming language.
A basic R language knowledge is highly recommended

Teaching methodology
Classes, Exercises, Course Reports and Exam
Material: Powerpoints, course notes and readings

Learning objectives of the subject
Demand, customer, discrete choice, utility, logit, probit, likelihood, entropy, Wardrop, satisfaction, elasticity, surveys, revealed references, stated preferences, Weibull, modal split, assignment, user equilibrium, system equilibrium, McFadden, Daganzo, Spiess, gravity model, calibration.

Study load

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

<table>
<thead>
<tr>
<th>Section</th>
<th>Learning time:</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Introduction to UTP modeling.</strong></td>
<td>4h</td>
<td><strong>Description:</strong> Introduction</td>
</tr>
<tr>
<td><strong>2. Data and Space</strong></td>
<td>12h</td>
<td><strong>Description:</strong> Data and space</td>
</tr>
<tr>
<td><strong>3. Trip generation</strong></td>
<td>8h</td>
<td><strong>Description:</strong> Trip generation modeling</td>
</tr>
<tr>
<td><strong>4. Trip Distribution</strong></td>
<td>11h</td>
<td><strong>Description:</strong> Trip distribution modeling</td>
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## 5. Modal split and discrete choice models

**Description:**
Modal split and discrete choice models

**Learning time:** 32h  
- Practical classes: 8h  
- Laboratory classes: 4h  
- Self study: 20h

## 6. Assignment

**Description:**
Assignment

**Learning time:** 8h  
- Practical classes: 2h  
- Laboratory classes: 1h  
- Self study: 5h

## 7. Behavioural Economics

**Description:**
Behavioural Economics

**Learning time:** 8h  
- Practical classes: 2h  
- Laboratory classes: 1h  
- Self study: 5h

## 8. Traffic and Revenue Forecasting

**Description:**
Traffic and Revenue Forecasting

**Learning time:** 8h  
- Practical classes: 2h  
- Laboratory classes: 1h  
- Self study: 5h
Exams

Learning time: 16h
Practical classes: 4h
Self study: 12h

Description:
The Quiz or Partial Exam takes place in the mid-semester week, which is programmed by ETSEIB. The date depends on ETSEIB and it is not set by teachers or students.
The Final Exam evaluates contents of the whole subject and it is programmed by ETSEIB at the end of the Term.

Course Report

Learning time: 18h
Laboratory classes: 2h
Self study: 16h

Description:
Course reports: Exercises and Laboratory Practices to be posted on ATENEA Tasks

Qualification system

Exercises (20%), course report (30%) and exam (50%)

Regulations for carrying out activities

Formula cribsheet, statistical tables and calculator are allowed

Bibliography

Basic: