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: 2019
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, univariate distribution of random variables, 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 Exams
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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<tbody>
<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>12.00%</td>
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<tr>
<td></td>
<td>Self study: 80h</td>
<td>64.00%</td>
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</table>
## Content

| 1. Introduction to UTP modeling. | **Learning time:** 4h  
Practical classes: 2h  
Laboratory classes: 1h  
Self study: 1h |
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<tr>
<td><strong>Description:</strong> Introduction</td>
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| 2. Data and Space               | **Learning time:** 12h  
Practical classes: 4h  
Laboratory classes: 2h  
Self study: 6h |
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<tbody>
<tr>
<td><strong>Description:</strong> Data and Space</td>
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</table>

| 3. Trip generation              | **Learning time:** 8h  
Practical classes: 2h  
Laboratory classes: 1h  
Self study: 5h |
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<tbody>
<tr>
<td><strong>Description:</strong> Trip generation modeling</td>
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</table>

| 4. Trip Distribution            | **Learning time:** 11h  
Practical classes: 4h  
Laboratory classes: 2h  
Self study: 5h |
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<tr>
<td><strong>Description:</strong> Trip distribution modeling</td>
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5. **Modal split and discrete choice models**

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

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

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6. **Assignment**

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

   **Description:** Assignment

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7. **Behavioural Economics**

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

   **Description:** Behavioural Economics

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8. **Traffic and Revenue Forecasting**

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

   **Description:** Traffic and Revenue Forecasting
# 250ST022 - Demand of Transportation Systems

<table>
<thead>
<tr>
<th>Exams</th>
<th>Learning time: 16h</th>
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<tbody>
<tr>
<td></td>
<td>Practical classes: 4h</td>
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<td>Self study: 12h</td>
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**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.

Partial exam (F1, 1/3) and global exam (F2, 2/3).
P Mark: Exercises/Reports.
E Mark = Max(F2, (F1 + 2F2)/3).
Final Mark = (P + E)/2.
COVID-19 health crisis during Semester 2 of the 2019-20 Academic Year does not affect the Qualification System of this subject.

<table>
<thead>
<tr>
<th>Course Reports</th>
<th>Learning time: 18h</th>
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<tr>
<td></td>
<td>Laboratory classes: 2h</td>
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<td>Self study: 16h</td>
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**Description:**
Course reports: Exercises and Laboratory Practices to be posted on ATENEA Tasks

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# Qualification system

Partial exam (F1, 1/3) and global exam (F2, 2/3).
P Mark: Exercises/Reports.
E Mark = Max(F2, (F1 + 2F2)/3).
Final Mark = (P + E)/2.
COVID-19 health crisis during Semester 2 of the 2019-20 Academic Year does not affect the Qualification System of this subject.

# Regulations for carrying out activities

Formula cribsheet, statistical tables and calculator are allowed
Bibliography

Basic:


