820767 - EEMPEI - Energy Economy and Comprehensive Energy Planning Models

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 709 - EE - Department of Electrical Engineering
Academic year: 2018
Degree: MASTER'S DEGREE IN ENERGY ENGINEERING (Syllabus 2013). (Teaching unit Optional)
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ECTS credits: 5  Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Martin Cañadas, Maria Elena

Teaching methodology
Lectures, guided study sections

Learning objectives of the subject
The aim of the course is to bring students to the fundamentals of energy economics, providing them the basic tools needed to understand the current energy problems and their interconnection with other fields.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group:</th>
<th>0h</th>
<th>0.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
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<td></td>
<td>Hours small group:</td>
<td>30h</td>
<td>24.00%</td>
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<td></td>
<td>Guided activities:</td>
<td>10h</td>
<td>8.00%</td>
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<tr>
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<td>Self study:</td>
<td>85h</td>
<td>68.00%</td>
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# Content

## 1. INTRODUCTION.
- **Learning time:** 4h  
  Theory classes: 4h

  **Description:**  
  1.1. Basic definitions: primary and secondary, renewable and non-renewable, commercial and non-commercial, conventional and non-conventional energy products.  
  1.2. Energy supply chain components.  
  1.3. Flow of energy products.

## 2. ENERGY BALANCE.
- **Learning time:** 9h  
  Theory classes: 9h

  **Description:**  
  2.1. Definition of energy balance, structure and typologies.  
  2.2. Analysis of the information of the energy balance. Energy supply mix, self-reliance in supply, share of renewable energies, efficiency of electricity generation, power generation mix, refining efficiency, overall energy transformation efficiency, per capita consumption of primary and final energy, energy intensity.

## 3. ECONOMIC FOUNDATIONS OF ENERGY DEMAND.
- **Learning time:** 56h  
  Theory classes: 56h

  **Description:**  
  3.1. Microeconomics basic concepts.  
  3.3. Cost minimization problem of the producer. Production function, isoquant curves, total cost of production, isocost lines, conditional factor demand functions, production expansion path.

## 4. ALTERNATIVE APPROACHES TO ENERGY DEMAND ANALYSIS.
- **Learning time:** 81h  
  Theory classes: 81h

  **Description:**  
  4.2. Index decomposition analysis. Analysis of change in total energy demand. Analysis of change in energy intensities.
Qualification system

\[ N = 0.4 \times N_1 + 0.3 \times N_2 + 0.3 \times N_3 \]

- \(N_1\): Examen final
- \(N_2\): Ejercicios entregados
- \(N_3\): Trabajo final

Bibliography

Basic:
