Course guide
820767 - EEMPEI - Energy Economy and Comprehensive Energy Planning Models

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 709 - DEE - Department of Electrical Engineering.

Degree: MASTER'S DEGREE IN ENERGY ENGINEERING (Syllabus 2013). (Optional subject).
MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Optional subject).
MASTER'S DEGREE IN ELECTRIC POWER SYSTEMS AND DRIVES (Syllabus 2021). (Optional subject).
MASTER'S DEGREE IN ENERGY ENGINEERING (Syllabus 2022). (Optional subject).

Academic year: 2023  ECTS Credits: 5.0  Languages: Catalan, Spanish, English

LECTURER

Coordinating lecturer: Martin Cañadas, Maria Elena

Others:

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>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Self study</td>
<td>80,0</td>
<td>66.67</td>
</tr>
<tr>
<td>Hours small group</td>
<td>30,0</td>
<td>25.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>10,0</td>
<td>8.33</td>
</tr>
</tbody>
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Total learning time: 120 h

CONTENTS

1. INTRODUCTION.

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.

Full-or-part-time: 4h
Theory classes: 4h
2. ENERGY BALANCE.

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.

Full-or-part-time: 9h
Theory classes: 9h

3. ECONOMIC FOUNDATIONS OF ENERGY DEMAND.

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.

Full-or-part-time: 56h
Theory classes: 56h

4. ALTERNATIVE APPROACHES TO ENERGY DEMAND ANALYSIS.

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

Full-or-part-time: 81h
Theory classes: 81h

GRADING SYSTEM

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

N1: Final Exam
N2: Delivery of exercises
N3: Final Work

BIBLIOGRAPHY

Basic: