| POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA | **SUBJECT DESCRIPTION** | **MODELO** PED.013.03 |
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|---|---|---|---|---|---|---|
| *Course* | **Energy and Environment** | | | | | |
| *Subject* | **Renewable Energies** | | | | | |
| *Academic year* | 2023/2024 | *Curricular year* | 2nd | *Study period* | 2nd semester | |
| *Type of subject* | Compulsory | *Student workload (H)* | Total: 140 | Contact: 60 | *ECTS* | 5 |
| *Professor(s)* | Prof. Carlos Alberto Figueiredo Ramos (PhD) | | | | | |
| ☒ *Area/Group Coordinator* ☐ *Head of Department* *(select)* | Prof. Rui Pitarma Ferreira (PhD) | | | | | |

## PLANNED SUBJECT DESCRIPTION

### 1. LEARNING OBJECTIVES

Recognition of the environmental implications associated with the production and use of energy. Knowledge of energy technologies, their environmental impact and its current and future importance.

### 2. PROGRAMME

**2.1 - Concepts about energy and environment**

- Energetic characterization; national and global.
- Production and consumption of energy.
- Sources of renewable and conventional energy.
- Energy from fossil fuels.
- Nuclear energy.
- Energy management and energy efficiency.
- Social, economic and environmental aspects.

**2.2 - Renewable Energies**

- Wind Energy.
- Solar energy.
- Biofuels.
- Energy from the sea.
- Geothermal Energy.
- Hydropower.
- Hydrogen.
- Social, economic and environmental aspects.

### 3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

The environmental implications associated with the production and use of energy, namely its environmental impact, are taught in the first section of the subject program.

The knowledge of energy technologies associated with fossil and renewable sources, including their current and future importance, are taught in both sections 1 and 2.

### 4. MAIN BIBLIOGRAPHY


- Teaching notes and presentations on the subject, 2024.
- Energias Renováveis, Fernandes, E. O., Atelier Nunes, ISBN: 978-989-96529-0-3.
- Energia Solar em Edifícios, Roriz, L., Rosendo, J., Eds. Orion, ISBN: 978-972-9620-15-8.
- Práticas de Energia Solar Térmica, Benito, T. P., Publindustria, ISBN: 9789728953393.
- Práticas de Energia Solar Fotovoltaica, Benito, T. P., Publindustria, ISBN: 9789728953423.
- Guía del instalador de Energía Eólica, Benito, T. P., Copyright, ISBN: 9788496300972.
- Bombas de Calor y Energías Renovables en Edificios, Martínez, F. J. R., ISBN: 8497323955.

**5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)**

Classes are taught through lectures, library research (including online), visit and/or follow-up work to energy laboratories/centers (fossil and renewable sources). Assessment is continuous, requiring the student to prepare, deliver and present final assignment(s) focusing primarily on renewable energy. For approval in the subject, the student must have a final grade greater than or equal to 10 out of 20.

**6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES**

The recognition of the environmental implications associated with the production and use of energy, namely its environmental impact, as well as knowledge of energy technology and its current and future importance, are taught through lectures, which also exposes cases/practical examples for analysis. The most practical component is highlighted with the monitoring and/or visit to energy facilities. The research in libraries (including online) also serves to support the preparation of assignments.

**7. PROFESSOR CONTACTS**

Office: 13
E-mail: framos@ipg.pt

**DATE**

**04 de março de 2024**

**SIGNATURES**

*Professor(s), Area/Group Coordinator or Head of Department signatures*

Professor

(signature)

Area/Group Coordinator

(signature)