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| POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA | SUBJECT DESCRIPTION | MODELO PED.013.03 |
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| Course | Mechanics and Industrial Informatics | | | | | |
| Subject | Renewable Energies and Energy Efficiency | | | | | |
| Academic year | 2023/2024 | Curricular year | 3rd | Study period | 2nd semester | |
| Type of subject | Compulsory | Student workload (H) | Total: 135 | Contact: 60 | ECTS | 5 |
| Professor(s) | Prof. Carlos Alberto Figueiredo Ramos (PhD) | | | | | |
| <input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department | (select) | Prof. Rui Pitarma Ferreira (PhD) | | | | |

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

1 – Know the environmental implications associated with the production and use of energy and associated renewable energy production technologies. 2- Acquire knowledge inherent to the efficient management and rational use of energy, namely in industry. 3- Recognize the importance of this issue as a key factor in achieving energy savings and environmental enhancement. 4- Develop students' critical spirit, taste for research and autonomy in analyzing energy consumption and implementing measures/plans for energy efficiency in accordance with portuguese and european legislation.

2. PROGRAMME

1 - RENEWABLE ENERGY

Energy status; The situation in Portugal and Europe; National Energy Strategy; Renewable Energy Sources; Social, economic and environmental aspects; Promotion of the use of energy from renewable sources in industrial installations. Production technologies.

2 - ENERGY EFFICIENCY

Energy management and conservation; Rules and regulations; Analysis of investments in energetic energy systems; Legislative framework (SGCIE; SCE,...); Identify and develop rationalization and energy efficiency measures; Energy audits and consumption rationalization plans; Efficient use in buildings and industry, techniques to reduce consumption and energy costs (Opportunities for Rationalization of Consumption, ORC); ORC analysis in buildings and industry; Implement rationalization and energy efficiency measures. Integration of renewable energies in energy rationalization and efficiency measures.

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3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

The themes listed in point 1 of the program allow students to achieve objectives (1) and (3).

The themes listed in point 2 of the program allow students to achieve objectives (2) and (4).

4. MAIN BIBLIOGRAPHY

- Fernandes E. O., et al., (2009). Energias Renováveis, Atelier Nunes e Pã. ISBN: 9789899652903.
- António M. F. da Silva J., (2012). Contributo para a Divulgação das Energias - Convencionais, Renováveis e Alternativas, PUBLINDUSTRIA. ISBN: 9789897230073.
- Benjamim F. Barros, Reinaldo Borelli, Ricardo L. Gedra, (2015). Eficiência Energética - Técnicas de Aproveitamento, Gestão de Recursos e Fundamentos, ÉRICA. ISBN: 9788536514260.
- APICER, Manual de Boas Práticas na Utilização Racional de Energia e Energias Renováveis, APICER.
- ISQ, (2019). Manual de Auditorias Energéticas na Indústria, ADENE – Agência para a Energia. ISBN: 978-972-8646-74-5.
- Sá, A. F., (2016). Guia de Aplicações de Gestão de Energia e Eficiência Energética (3ª edição). Publindústria. ISBN: 9789897231544.
- Miscellaneous regulations and standards (ex. SCE, SGCIE...).
- Tietenberg, Tom, (2012). Environmental and Natural Resource Economics. Pearson. ISBN: 987-0-13-139257-1.
- Teacher notes, 2024.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching methodology: - Lecture method using video-projector, teacher's notes and Internet;

- Demonstrative method and case studies using demonstrations and laboratory work.

Assessment rules: - individual written test with a weight of 60% and research and laboratory work with a weight of 40%, or – work(s) with a final public presentation.

The student will be approved in the subject if he obtains an evaluation equal to or greater than 10 values.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

The expository methodology is used to present the fundamental contents associated with all objectives. The methodology of practical work by the student allows him to apply, throughout the semester, in a practical way, the contents covered. In this way, the aim is to motivate students to actively learn theoretical and practical knowledge by carrying out practical cases

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that value applicability in a professional context. The methodology thus intends to encourage students to develop demanding work compatible with the requirements of the labor market in accordance with Portuguese legislation.

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)