

Course Syllabi

1. INDU-00030 ENERGY MANAGEMENT

2. Instructor:

- Ivan Andres Montero Izquierdo

3. Bibliography

- Solar Energy Engineering. Processes and Systems / <https://research.ebsco.com/linkprocessor/plink?id=e99fdd05-b4cf-3f8a-a5fc-321d6ef0d858>, Kalogirou, Soteris A., 2014
- Guía de Implementación de Sistemas de Gestión de la Energía basados en ISO 50001:2018 / https://www.agenciase.org/wp-content/uploads/2022/11/SISTEMA_ISO_50001_2022.pdf, Atia Consultores Ltda., 2022
- Guide to energy management / <https://research.ebsco.com/linkprocessor/plink?id=c419d4dc-056e-30b6-822c-31215e7600a5>, Capehart, Barney L.; Turner, Wayne C.; Kennedy, William J., 2008
- Energías renovables, González Velasco, Jaime, 2009

4. Specific Course Information

- a. Energy management is the set of actions and processes aimed at optimising energy consumption in order to achieve greater efficiency and rationality without this implying a decrease in performance. Within this context, this subject allows the student to understand the main actions to consider in an industry to efficiently use energy. To this end, it is necessary that the student know the international and national context about the use of conventional energy sources and their involvement with the environment, as well as the use of renewable energy sources and their important growth in the last decade. Based on this knowledge, solutions to fossil fuel-based energy systems can be applied and alternative solutions can be proposed based on renewable energy sources, with the intention of being incorporated into an energy management system. non-collaborative based on active methodological techniques such as inverted classroom (flopped classroom), case study or problem-based learning (ABP). This subject contributes to the graduation profile in general and specific competencies, where the student:
- Acts with respect and commitment to the environment, applying management practices and technologies, that allow him to minimize the environmental impact generated by productive activities.
 - Evaluate and develop industrial projects with technical criteria and economical, to estimate its feasibility.
 - Apply knowledge and skills in mathematics, physics and chemistry, effectively, as basic tools for solving problems in the field of Chemical Engineering.

b. Prerequisites:

- INGE-00034 Thermotechnics
- INDU-00032 Engineering Reactions III

5. Learning Objectives of the Course

- a. Identify and evaluate technical solutions with the aim of finding opportunities for improvement for energy systems in the industry within the framework of energy management.
- Propose technical solutions related to energy sources by analyzing and evaluating their social and environmental impact.
 - Critically propose solutions based on energy efficiency measures.
 - Identify the basic requirements of an energy management system.

b. Learning Outcomes

1. It analyses and values the social and environmental impact of technical solutions related to energy

sources, acting with ethics, professional responsibility and social commitment.

2. Identify the main components in an energy management system.

3. Identify the main components in an energy management system.

4. It proposes energy efficiency solutions and makes decisions with critical reasoning.

5. It proposes energy efficiency solutions and makes decisions with critical reasoning.

6. It analyses and values the social and environmental impact of technical solutions related to energy sources, acting with ethics, professional responsibility and social commitment.

7. It analyses and values the social and environmental impact of technical solutions related to energy sources, acting with ethics, professional responsibility and social commitment.

6. Course Topics

1. Introduction to energy management.

2. Generation, conversion and effective use of energy.

3. Energy management system in industry.

4. The application of energy efficiency to the reality of ecuador.