Energy and Environment

In brief

Course langage: French

Presentation

Learning objectives

The main objective is to learn about and understand the operation of modern thermal power plants. This includes:
- a general approach to energy requirements and in particular to electricity .
- knowledge of thermodynamic production cycles and their optimization .
- knowledge of the mechanisms of gas combustion .
- an approach to sustainable water management (resources, analysis, control) .
- management of combustion gases by absorption.

Description of the programme

- evolution of needs and resources :
- environmental impact
- Basic information on fuels
- energy generation issues

Water management and treatment :
- water resources
- upstream treatment

Combustion and pollutants :
- homogeneous combustion
- combustion with/without pre-mixing

Absorption :
- the different pollutants
- the main treatment processes
- isothermal absorption

A visit of the thermal power plant of Martigues will be organized.

Generic central skills and knowledge targeted in the discipline

- Ability to adopt a global vision and understand the problem in its complexity
- Ability to model and organize the resolution
- Ability to develop and understand a scientific and technical project

How knowledge is tested

100% project-based assessment
Students will be given a project to design a thermal power plant in pairs to implement all the knowledge and skills acquired during this module.

Bibliography

— Woodruff EB, Lammers HB, Lammers TF. Steam Plant Operation, 10th Edition. McGraw Hill Professional; 2016
— Dincer, I., & Zamfirescu, C. (2014). *Advanced power generation systems*. Elsevier

Teaching team

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Sustainable Development Goal


Clean water and sanitation


Affordable and clean energy


Responsible consumption and production


Climate action

Total des heures **0h**

Useful info

Name responsible for EU

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