

# **Energy and Environment**

#### In brief

> Course langage: French

# Presentation

# Prerequisites

No

# 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



### **Energy and Environment**

- 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
- Z Dincer, I., & Zamfirescu, C. (2014). Advanced power generation systems. Elsevier

# Teaching team

Pascal Denis, Pierrette Guichardon, Pierre Boivin

## Sustainable Development Goal



Climate action

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Affordable and clean energy



Responsible consumption and production



**Energy and Environment** 

Total des heures		30h
CM	Master class	16h
TD	Directed work	12h
AU		2h
Useful info		

# Name responsible for EU

#### Lead Instructor

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