

Energy and Environment

In brief

> **Course language:** 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.
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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		30h
CM	Master class	16h
TD	Directed work	12h
AU		2h

Useful info

Name responsible for EU

Lead Instructor

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