

Metrology Environnement and Risks

 ECTS
6 credits Component
INSTITUT
NATIONAL
DES SCIENCES
APPLIQUEES
TOULOUSE Number of
hours
67h

Presentation

Description

Law and Regulations in Environment

Environment Process Safety

- Dispersion of pollutants - modeling, risk assessment methods on the environment,
- Characterization and classification of wastes, waste management (treatment and storage sectors), common and radioactive wastes, environmental impact of wastes .
- Notions about the main categories of risk in Chemical Engineering: calculating probabilities of effects induced on human, toxicity, different types of explosions, thermal-runaway. Methods and devices for protection .

Metrology for Environment

- quality of measurements (accuracy, detection and quantification thresholds, robustness, repeatability, reproducibility)
- Metrology for measuring environmental impacts and / or processes design

Organisation:

Law in Environment (lectures 10h tutorials 5h)

Environment Process Safety (30h)

Environment (15h lectures / TD)

Process safety 15h including 10h lectures and 5h tutorials

Research project combining law and environmental risks (80h Estimated personal work)

Metrology for Environment (during lectures 3.75h tutorials 5h Labworks 24h)

measurement tools applied to the characterization of complex matrices or media (NTK analyzers, COD, gas, on-line UV, ionic chromatography ...). Meaning of quantities in the fields of environment and processing methods.

Quality of measurements: accuracy, reproducibility, detection and quantification thresholds. Statistical analysis of the measurements and for data calculations.

Application to the analyses of compounds in complex solutions, offline and online measurements for compounds in both liquid and gas phases, characterizations of aerobic and

anaerobic biological degradation (determination of kinetic and stoichiometric parameters).

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

- the principles of environmental laws in France , and what tools to access legal informations
- the choice of suitable and argued measurements either for the analysis of environmental impacts or to process design
- what are the main environmental issues and principles of waste management
- the main risks in the process industry and mechanisms linked to accidents

The student will be able to:

AA1 : find and use legal informations (from legacy context) related to environmental law (ICPE , TGAP , environmental impacts, ...)

AA2 : choose and apply relevant method (s) in order to characterize the compounds and / or pollutants in complex environments or matrix doing a critical analysis of the methodology and the experimental results

AA3 : analyze a case of risk for Environment , to identify the categories of impacts, to describe pollution from the origin (=source) to the environmental targets

AA4 : analyze a situation of industrial risk, to identify and to calculate physico-chemical parameters of the involved phenomena and to propose technical solutions

Pre-requisites

The whole Chemical Engineering course.

Useful info

Place

➤ Toulouse