

PR2940 Processes and Environment Laboratory

Professor: Barbara Malinowska, Mohammed Rakib

Language of instruction: French or English – **Number of hours:** 30 – **ECTS:** 2

Prerequisites: No prerequisite but training in Chemical Engineering and knowledge of the basic notions of Analytical Chemistry and Electrochemistry would be useful.

Period: S5 November to December IN15DXP, FEP5DXP

S6 between February and June IN16DXP, SEP6DXP

Course Objectives

Propose to the students, working in groups of two or three under the responsibility of a teacher or a researcher, an initiation to the scientific research through a project.

Acquire the knowledge base enabling: to perform a bibliographic research on a scientific subject; to be able to plan the experimentation in laboratory; to present clearly the results; to have a critical view on obtained results; to work with the respect to the safety regulations for laboratories.

On completion of the course, students should be able to

- ◇ put in practice the methodological aspects of experimental studies
- ◇ know the the basic theory of membrane and electromembrane processes
- ◇ use the pilot units (electrodialysis, ultrafiltration, nanofiltration, electrolysis)
- ◇ use modern analytical tools (titration, atomic absorption spectrometry, infrared spectrometry FTIR-ATR)

Course Contents

The students begin by a bibliographical research. The aim is to place the project in the general context and to establish the state of the art versus the proposed subject. Then, to reach the purpose, they have to make the experiments by implementing the operations and conditions chosen by themselves. In the end of experimental work, they have to analyse and discuss the obtained results.

The proposed subjects concern:

- ◇ treatment of solid, liquid or gaseous effluents by lixiviation, separation, concentration,...
- ◇ treatment of salted effluents (membrane and/or electromembrane processes)

It is a question of the implementation of the clean processes with the aim of waste recovery or effluents decontamination.

Course Organization

- ◇ Presentation of the themes: 3 hr
- ◇ Labwork: 20 hr
- ◇ Preparation of the presentation and oral defense : 7 hr

Written report to prepare within a week

Teaching Material and Textbooks

Course notes and scientific articles from the bibliographical research carried out during this activity

Resources

Lecturers and researchers (TBC): Imène Belmahdi, Arnaud Buch, Hervé Duval, Julien Lemaire, Barbara Malinowska

Evaluation

- ◇ Experimental work (coef 2)
- ◇ Oral defense (coef 1)
- ◇ Behavior and respect for safety regulations in the laboratory (coef 1)
- ◇ Written report (coef 1)