

Pollution

Calendar: 5th semester

Contact Hours: TP - 45,0; OT - 7,5

Scientific Area: Engenharia Química Industrial

Learning outcomes of the curricular unit

The aim of this UC is for students to identify the main sources of pollution of air, water and soil systems and establish actions to minimize pollution and carry out a planned inspection/ monitoring of the polluted areas. Also national and EU legislation in this area must also meet, as well as the ongoing actions of various National and International agencies. This curricular unit enables students the following skills: assist in the evaluation of environmental risk situations and proposing solutions for the prevention; analyze and discuss different alternatives for waste management, know the principles of operation of each air handling, water, effluents and waste organs.

Syllabus

1- Environmental politic

2- Ecology

3. Air Pollution: Broadcasters Sources, Pollutants and their Effects; Global impacts

Associated with air pollution, monitoring of Air Quality Dispersion of Pollutants in the Atmosphere, Gas method treatment;

4. Water: Water Availability in the Environment, Water Treatment Systems, Wastewater Treatment - Unit Operations of pretreatment. -Sedimentation - Biological Processes – sludge treatment - Treatment in Soil and Natural Systems.

5. Solid Waste: Waste Types, Sources and Characteristics; Production

Waste, Waste Inventory, Waste Interaction with Air, Water and Human Health; Waste Classification;

Management of Solid Waste - Collection, Transport, Transfer, Treatment and Landfill.

Demonstration of the syllabus coherence with the curricular unit's objectives

The syllabus of this UC is divided into 4 major Chapters, aiming the acquisition of the proposed curricular unit's objectives. Thus, in chapter 1 it will be described environmental policies, both national and international, with the emphasis on consultation and interpretation of European directives and national legislation. In chapter 2, it is presented basic concepts of ecology, with the aim to demonstrate the impact of the pollutant emissions in the environment. In chapters 3, 4 and 5 it is described and identified the main sources of pollution and pollutants in the air, water and soil, showing some emphasis on the impact that these pollutants present on the environment and human health, showing the existing technologies for pollutant emissions treatments, for each of the case.

Teaching methodologies:

The classes of the UC are organized into four fundamental blocks. For each of these blocks theoretical material will be presented promoting the involvement and participation of all students developing their reasoning skills and stimulating their critical thinking. Material will be available for consultation about the contents taught as well as the preparation, presentation and discussion of a work.

Demonstration of the coherence between the teaching methodologies and the learning outcomes.

he teaching methods are consistent with the objectives of the curricular unit since the exposure of contents by the teacher combined with the practical case studies by the students (field trips and group/individual work) will allow to: 1) the acquisition of knowledge of the syllabus contents; 2) to familiarize the students with important concepts 3) together with previously acquired knowledge, develop critical skills for finding solutions to preserve the environment. The evaluation methodology is designed to measure the extent to which skills were developed.