

Course guide

240EQ311 - 240EQ311 - Environmental Chemistry

Last modified: 26/06/2025

Unit in charge: Barcelona East School of Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: **Academic year:** 2025 **ECTS Credits:** 4.5
Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: JOAN DE PABLO RIBAS

Others:

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

Analizing the sources and problems associated with chemical pollution and how to solve them considering sustainability and prevention

Knowing the environmental compartments, their problems and the interactions between them

Understanding the concepts of Green Chemistry and Industrial Ecology and its role in the prevention and treatment

Analytical techniques for environmental monitoring

STUDY LOAD

Type	Hours	Percentage
Hours small group	40,5	36.00
Self study	72,0	64.00

Total learning time: 112.5 h



CONTENTS

ENVIRONMENTAL CHEMISTRY

Description:**1- INTRODUCTION**

The five environmental spheres. Definition of Environmental Chemistry. The cycles of matter. Human impact and pollution. Transport and Chemical fate.

2- ANTHROSPHERE. INDUSTRIAL ECOLOGY

Industrial ecosystems. Environmental impacts of industrial ecology. Lifecycles. Analysis of the life cycle. Green chemistry and industrial ecology. Sustainability.

3- HYDROSPHERE

Water properties. Hydrological cycle. Chemical processes in the water. Water Pollution: metals, inorganic, organic pollutants emerging species.

4- GEOSPHERE

Nature of the solids in the geosphere. Environmental Geochemistry. Phenomena associated with interfaces Earth - ocean and land - atmosphere. Pollution in the geosphere. The soil and food production: macro and micro nutrients, fertilizers, pesticides. Green chemistry and sustainable agriculture.

5- ATMOSPHERE

Chemical and photochemical reactions. Transport and Chemical fate. Air pollutants: particulate inorganic gases, organic compounds. Photochemical smog. Threats to the global atmosphere: global warming, acid rain, destruction of the ozone layer.

6- ENVIRONMENTAL MONITORING

Water analysis. Analysis of hazardous waste in solid phase. Atmospheric assessment

Full-or-part-time: 110h

Theory classes: 40h

Guided activities: 10h

Self study : 60h

GRADING SYSTEM

RESOURCES

Audiovisual material:

- Transparències QUÍMICA AMBIENTAL. ENVIRONMENTAL CHEMISTRY slides