

# Bioremédiation / Environmental engineering : current methods and practices

## Lecturers

David CANNELLA (Coordinator) and Michel VERBANCK

## Course mnemonic

BING-F531

## ECTS credits

5 credits

## Language(s) of instruction

English and French

## Course period

First term

## Course content

The aim of this course is to provide students with an understanding of the basic and practical function of bioremediation and microbial degradation of industrial waste. The course primarily lays on novel discoveries in biodegradation of environmental pollutants, thus requires knowledge of applied microbiology and biochemistry which are prerequisites to attend the course. The multidisciplinary aspects concern the bioengineering technologies that are needed to deploy the microbiological techniques: landscape and field intervention among the others. Petroleum derived hydrocarbons, hexachlorocyclohexane (HCH), plastics, textile dyes, heavy metals, agricultural waste, pesticide and aromatic compounds are all examples of targeted pollutants which will have dedicated lectures during the course.

## Objectives (and/or specific learning outcomes)

Understanding of biodegradation and bioremediation technologies in soil and waters contaminated by chemical molecules

## Pre-requisites and co-requisites

### Pre-requisites courses

CHIM-H422 | Environmental technology / Applied hydrology, hydraulic routing and hydrometry | 5 crédits

## Teaching method and learning activities

cours ex cathedraThe course consists of 27 hours of lectures that address main bioengineering concepts of bioremediation technologies. The course maintains a "frontiers of science" setting

in which latest results in bioremediation of organic compounds, industrial and agricultural waste are discussed. During the lectures deep biochemistry or enzymatic catalysis will be shown, as such background knowledge on biochemistry is expected. Basic concepts of microbiology and bioengineering are a plus. The students will have to choose a topic and focus on that for a literature review on technological advances on bioremediation of the chosen contaminant. A personal short written report will have to be produced by the student at the end of the course, active discussion and understanding of the specific biodegradation strategies could be an integrating part of the classes. The final report could be written in English or French following the general guideline of a scientific manuscript preparation (abstract, introduction, detailed state-of-art, conclusions, references....).

## References, bibliography and recommended reading

Advances in biodegradation and bioremediation of industrial waste. Ram Chandra, CRC press, available at ULB library of sciences and technologies Solbosch

## Other information

### Contact(s)

david.cannella@ulb.ac.be

## Evaluation method(s)

Other

### Evaluation method(s) (additional information)

Students will conduct individual search of 30-50 scientific publication on a chosen thematic linked to the bioremediation, ultimately write a short personal report.

### Determination of the mark (including the weighting of partial marks)

1/3 written report quality 2/3 answers to the questions linked to personal report

## Programmes

### Programmes proposing this course at the faculty of Sciences

MA-IRBE | Master in Environmental Bioengineering | finalité Professionnelle/unit 2

## Programmes proposing this course at the Brussels School of Engineering

MA-IRBE | **Master in Environmental Bioengineering** | finalité  
Professional/unit 2

