Summary

This course covers the essential knowledge of contaminant partitioning and techniques to monitor chemical species, physical extent of contamination and biological processes. In the second part, remediation approaches are tackled. This course represents the fundamentals of remediation.

Content

Fundamental contaminant partitioning principles
Microbial processes and their quantification
Advanced monitoring techniques for contaminated sites
Physical, chemical and biological approaches to remediation

Keywords

partitioning
microbial processes
bioremediation
physico-chemical processes

Learning Prerequisites

Recommended courses
General Chemistry
General Biology
Microbiology for engineers
Soil science

Important concepts to start the course
Fundamentals of soil science, porosity, bulk density
Major biological processes, sulfate reduction, denitrification
Partitioning of contaminants between phases
Groundwater flow

Learning Outcomes

By the end of the course, the student must be able to:

• Synthesize information about a contaminated site
• Design a remediation approach appropriate for a given site
Transversal skills

• Use a work methodology appropriate to the task.

Teaching methods
Lectures, homework and a project (written report and oral presentation)

Expected student activities
The students are expected to attend the lecture, to work on the homeworks and be ready to ask questions during the homework session.
The project entails proposing an appropriate remediation approach for a given site, writing a report and presenting the project in an oral presentation.

Assessment methods
The written test is 50% and the oral presentation is 20% and the report is 30%. Which means that the project represents 50% (oral presentation and report).

Supervision
Office hours No
Assistants No
Forum No

Resources
Bibliography
Reading assignments available on Moodle

Ressources en bibliothèque
• Practical handbook of material flow analysis / Brunner, 2004

Références suggérées par la bibliothèque
• Handbook of material flow analysis / Brunner, 2nd ed., 2017
• Metabolism of the anthroposphere : analysis, evaluation, design / Baccini, Brunner, 2nd ed., 2012

Notes/Handbook
Course notes available at the bookstore.

Moodle Link
• http://moodle.epfl.ch/course/view.php?id=7931

Prerequisite for
Specialization in Environmental chemistry and processes