
# BIR1332 Soil sciences

[30h+7.5h exercises] 3 credits

This course is taught in the 1st semester

**Teacher(s):** Bruno Delvaux, Joseph Dufey
Language: French
Level: First cycle

## Aims

This course aims the understanding of the dynamics of complex ecological systems. It forms the student to a functional and quantitative approach of the terrestrial ecosystems. The fundamental principles of ecology are studied based on the functioning of the ecosystems, notions of equilibrium, cycles, succession and dynamics of populations. It gives the student a synthetic view of the ecological diversity and mainly sets the accent on the study of the processes and their own dynamics, the interactions between components of the ecosystem and the factors controlling these interactions.

## Main themes

The content of this course follows that of the courses BIR 1100 'Introduction aux sciences de la terre', BIR 1230 'Introduction à l'ingénierie de la biosphère', BIR1333 'Bioclimatologie', BIR 1310 'Etudes des phénomènes de transferts' and BIR1201 'Exercices intégrés de mathématiques et informatique'.
Based on the notions acquired in these courses, the following elements will be further studied, putting the accent on the terrestrial ecosystems:
- the biosphere: energetic balance, biogeochemical cycles, biome distribution;
- the functioning of an ecosystem: physical and biological determining factors, flux of matter and of energy, cycles, equilibrium, productivity, impact strength (resilience), notions of observation scales;
- the biocenosis: niche, types of relations between the beings, trophic chains;
- population dynamics: demographic strategies, growth models;
- model making of processes inside the ecosystem: interactions between components and the factors controlling these interactions, stimulation principles.
Practical exercises: 1) measure of the environmental parameters (physical approach), problems with instruments and data encoding. 2) Analysis of a numerical model representing a fundamental process of the ecosystem, the population dynamics# 3) Excursions.

## Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Precursory courses : All courses of BIR 11 and BIR 12
The organization of the program should not allow the student to follow this course before the courses of 'Bioclimatologie' and 'Phénomènes de transfert'. The content of the course is closely related to the course 'Exercices de pédologie et d'écologie agricole et forestière'.

## Programmes in which this activity is taught

**BIR2** Bio-ingénieur

## Other credits in programs

| | | | |
|---|---|---|---|
| **BIR21/A** | Première année du programme conduisant au grade de bio-ingénieur (Agronomie) | (3 credits) | Mandatory |
| **BIR21/E** | Première année du programme conduisant au grade de bio-ingénieur (Environnement) | (3 credits) | Mandatory |
| **BIR22/4C** | Deuxième année du programme conduisant au grade de bio-ingénieur : Chimie et bio-industries (Technologies environnementales: eau, sol, air) | (3 credits) | Mandatory |