

## Soil Biogeochemistry of Agroecosystems (I002897)

**Course size** *(nominal values; actual values may depend on programme)*

**Credits** 6.0

**Study time** 180 h

**Contact hrs**

60.0h

**Course offerings in academic year 2022-2023**

A (semester 1)

English

Gent

**Lecturers in academic year 2022-2023**

Maier, Martin

GOTTIN01 lecturer-in-charge

**Offered in the following programmes in 2022-2023**

[International Master of Science in Soils and Global Change \(main subject Soil Biogeochemistry and Global Change\)](#)

**crdts**

6

**offering**

A

**Teaching languages**

English

**Keywords**

**Position of the course**

**Contents**

In the framework of this module, biogeochemical processes of C, N, P, S and Fe cycle in agroecosystems shall be demonstrated and their microbial and molecular basics will be unraveled. It will be shown how agricultural management practices (crop sequences, tillage, fertilization, etc.) will impact the element cycles. Analytical biogeochemical methods to assess these effects on element fluxes and cycles will be explained in detail. Isotope-based examples and experiments to assess formation and turnover of soil organic matters as will be explained. The module consists of a lecture (3 SWS) and a seminar (1 SWS) in which a methodological focus will be set where one study of interest will be presented by the students, and training study will be implemented

**Initial competences**

Basics in soil science and biology and chemistry

**Final competences**

- 1 Understanding underlying process of C, N, P, S and Fe cycle in agroecosystems
- 2 Understanding the impact of agricultural management on these element cycles
- 3 Quantification of C-, N- and P-fluxes via isotope based methods (labeling experiments such as pulse labeling, FACE experiments, C-3 and C-4 vegetation changes, autoradiography)
- 4 Formation of soil organic matter from plant and microbial residues: Disentangling the composition of SOM by biomarker methods
- 5 Theoretical basics shall be thought and their application shall be demonstrated at distinct examples from literature. After this course, students will be able to understand complex biogeochemical studies published and evaluate potentials and pitfalls of applied methods.

**Conditions for credit contract**

This course unit cannot be taken via a credit contract

**Conditions for exam contract**

This course unit cannot be taken via an exam contract

**Teaching methods**

Lecture

**Learning materials and price**

## References

### Course content-related study coaching

### Assessment moments

#### Examination methods in case of periodic assessment during the first examination period

Oral examination, Assignment

#### Examination methods in case of periodic assessment during the second examination period

Oral examination, Assignment

#### Examination methods in case of permanent assessment

#### Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

#### Extra information on the examination methods

*Oral exam of 20 minutes (75% of the overall grade) and evaluation of the 15 min presentation (25% of overall grade)*

Understanding of biogeochemical cycles in agroecosystems and their drivers as well as the impact of agricultural management on them. Ability to choose, evaluate and discuss about various biogeochemical, molecular and microbiological methods to study element cycles and their drivers in soils.

#### Calculation of the examination mark