

Isotopes in Ecosystem Sciences (e-learning course) (1002899)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size	<i>(nominal values; actual values may depend on programme)</i>		
Credits 6.0	Study time 180 h	Contact hrs	60.0 h

Course offerings in academic year 2022-2023

A (semester 1)	English	Gent
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Lecturers in academic year 2022-2023

Dippold, Michaela	GOTTIN01	lecturer-in-charge
Banfield, Callum Colin	GOTTIN01	co-lecturer
Dorodnikov, Maxim	GOTTIN01	co-lecturer
Dyckmans, Jens	GOTTIN01	co-lecturer

Offered in the following programmes in 2022-2023

	crdts	offering
International Master of Science in Soils and Global Change (main subject Soil Biogeochemistry and Global Change)	6	A

Teaching languages

English

Keywords

Position of the course

Contents

- Introduction, stable and radioactive isotopes
- Labeling and natural abundance, Tracer approaches
- Quantifying of stable and radioactive isotopes (Isotope ratio mass spectrometry, gas lasers, scintillation counting, autoradiography and phosphorimaging, gamma-detectors, accelerated mass spectrometers, etc.
- Applications of isotopes in soil – plant – ecosystem studies
- C, N and P input by plants into the soil ^{14}C , ^{13}C , ^{15}N , ^{33}P
- C turnover and soil organic matter studies ^{14}C , ^{13}C
- Nutrient cycles in soils ^{15}N , ^{33}P , ^{32}P
- Visualization of belowground processes ^{14}C , ^{33}P , ^{32}P
- Isotope dilution method ^{15}N
- Bomb- ^{14}C : a global labeling approach ^{14}C
- Use of isotopes for erosion quantification ^{137}Cs
- Coupling of isotopes with molecular biology and biomarkers
- Metabolic tracing based on position- and dual isotope labeling approaches

Initial competences

Basic soil science and chemistry knowledge

Final competences

The course is aimed to deepen the competence in the use of isotopes to study ecosystem processes. It aims at familiarizing the participants with a broad set of isotope applications, from fractionation based natural abundance approaches up to tracer applications. Advantages and

disadvantages of stable and radionuclides will be discussed and the set of instrumentation required for their measurement shall be understood.

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

Evaluation methods

Examination methods in case of periodic evaluation during the first examination period

Written examination

Examination methods in case of periodic evaluation during the second examination period

Written examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Calculation of the examination mark