科目ナンバリング	U-LAS61 10019 LE58						
授業科目名<英訳>	Introduction to Biogeochemistry-E2 Introduction to Biogeochemistry-E2			担当者所属職名・氏名	農学研究科　教授　Daniel Epron		
群	統合科学科目群		分野(分類)	環境		使用言語	英語
旧群		単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2025・前期	曜時限	月2	配当学年	主として1・2回生	対象学生	全学向

[授業の概要・目的]

Biogeochemistry studies the physical, chemical and biological processes that govern the exchanges of energy and matter between the biosphere, the atmosphere and the lithosphere. The course presents the main terrestrial biogeochemical cycles and discusses how natural processes influence them and how they are altered by anthropogenic disturbances. Particular attention will be paid to the global carbon cycle and the importance of soil organic matter in this cycle. This subject is on the border of physics, chemistry, biology, and earth science. It brings important concepts that form the basis of environmental science.

[到達目標]

Upon successful completion of this course, students will be able (i) to understand the role of biological, chemical and physical processes in determining the fate of the major elements ecosystems and in the terrestrial biosphere, and (ii) to anticipate the effects of management practices on soil organic matter and inherent site fertility.

[授業計画と内容]

Course schedule:
1. Introduction to biogeochemistry: element reservoirs and fluxes
2. Biomass, primary production and net ecosystem production
3. Decomposition and mineralisation of organic matter.
4. Land use, land use change and soil organic matter
5. Production, emission and consumption of methane by soils and vegetation
6. Anthropogenic disturbances of major biogeochemical cycles: the global carbon cycle
7. Nutrient cycles and budget in terrestrial ecosystems
8. The biological cycle of nitrogen
9. Weathering and mineral alteration
10. Nutrient limitations and ecosystem fertility
11. Nutrients in aquatic ecosystems: oligotrophy and eutrophication
12. Anthropogenic disturbances of the global N and P cycles
13. Energy and water balances of terrestrial ecosystems
14. Human impact of the water cycle: the blue water / green water paradigm
15. End of Term Exam
16. Feedback

[履修要件]

Beneficial but not mandatory: basic knowledges in biology and chemistry (high school)

[成績評価の方法・観点]

Grading: Quizzes or questions based on previous class contents (after each class on PandA, 50%), end of term exam (50%).
In no case will English language proficiency be a criterion for evaluating students. Tests and exams are designed to allow short answers.

Introduction to Biogeochemistry-E2(2)へ続く↓↓↓

Introduction to Biogeochemistry-E2(2)

Class attendance is expected: students who are absent more than three times without sound reasons (documented unavoidable absence) will not be credited.

[教科書]

Lecture notes and slides will be provided before each class (uploaded on PandA).

[参考書等]

（参考書）

Chapin III FS, PA Matson, P l.『Principles of Terrestrial Ecosystem Ecology』（Springer）
ISBN:ISBN 978-1-4419-9503-2（Recommended books to deepen the course content (not mandatory)）
Schlesinger WH, Bernhardt ES『Biogeochemistry: An Analysis of Global Change』（Academic Press）
ISBN:ISBN 978-0123858740（Recommended books to deepen the course content (not mandatory)）

[授業外学修（予習・復習）等]

Students are expected to review the course content of previous classes and to read the materials distributed before each class (about two hours between two classes).

[その他（オフィスアワー等）]

Students are encouraged to ask questions and to make comments during the class.
Students are welcome to arrange appointments by email, even outside the official office hour, for questions and discussion.

[主要授業科目（学部・学科名）]