

## Biodiversity Conservation (C003315)

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

**Credits 4.0**

**Study time 120 h**

**Course offerings and teaching methods in academic year 2024-2025**

A (semester 2)

English

Gent

lecture

peer teaching

independent work

**Lecturers in academic year 2024-2025**

Giraldes Simoes, Ana Rita

WE11

lecturer-in-charge

**Offered in the following programmes in 2024-2025**

[Master of Science in Teaching in Science and Technology\(main subject Biology\)](#)

**crdts**

**offering**

4

A

[Master of Science in Biology](#)

4

A

[Exchange Programme in Biology \(master's level\)](#)

4

A

**Teaching languages**

English

**Keywords**

(Inter)national agreements on biodiversity (Convention on Biological Diversity, Millenium Ecosystem Assessment, CITES, IUCN, Traffic, WCMW-UNEP), management and organisations (FAO, ICLARM), sustainable use of natural resources (e.g. fisheries, woodlands), examples from air, soil and water, bio-indicators and monitoring, management and threats on biodiversity (ecotourism as a sustainable resource for a realistic biodiversity management?).

**Position of the course**

Students will obtain knowledge about the actual management rules regarding the protection of biological diversity (including genes, species and habitats); with this information, relevant research questions should be formulated taking into account actual socio-economic problems. Fundamental biological knowledge will be translated into socially relevant problems (conservation of rare species, invasive species, alien species and their role in ecosystems, sustainable management of natural resources, ...).

**Contents**

**General aim of the course:**

Discuss and formulate examples of fundamental and applied research that are relevant for international biodiversity policy in order to maintain biological diversity and ecosystem health.

**General overview of the course:**

- What is biodiversity? How is it perceived by the public, valued, and measured?
- Why is biodiversity important?
- What are the main concerns surrounding biodiversity?
- What are the main causes of biodiversity loss?
- What are the International agreements (conventions) on biodiversity.
- Resources and tools for biodiversity research.

**Introduction: what are the biodiversity problems?**

Overview of the document "Ecosystems and Human well-being – Biodiversity Synthesis" is used as the red line through the introduction (<http://www.millenniumassessment.org/>).

Following questions are treated : What is biodiversity and why is biodiversity

important ? What are the recent insights in applied biodiversity within a socio-economic context ? What are the scientific challenges for applied biodiversity ?

**Causes of biodiversity loss: habitat change, climate change and overexploitation:**

Based on recent scientific knowledge, the effects of climate change is discussed in phenology, natural resources (fisheries), water management, deforestation, habitat use in relation to socio-ecological indicators

**What is the legal context: national / international?**

History of the legal framework of protection of biodiversity; what are the local, regional and international differences?

**Goods and services of biodiversity and monitoring:**

How can biodiversity be used and valorised? What is the socio-economic importance of biodiversity? Which bio-indicators are best for use in applied biodiversity?

**Trade induced loss of biodiversity:**

- *Biodiversity of the trade*: biodiversity in the trade for consumption (fisheries, bush meat, aquaculture), pet trade (ornamentals, trade in rare reptiles, etc.), sports (fishing, trophy hunting) and products (fur, leather, etc.).
- *Organisations controlling the trade*: governmental organisations (FAO, UNEP-WCMC, CITES, EU-CITES regulations); non-governmental organisations (WWF, IUCN, TRAFFIC, MAC, Bush meat task force).
- *Control activities*: CITES activities, UNEP-WCMC review reports).
- *Effects of the trade*: direct and indirect effects.

**Resources and tools for Applied Biodiversity Research:**

- *Zoological taxon-specific databases*: comprehensive, invertebrate, fish, amphibian, reptile, bird and mammal databases.
- *Trade related databases*: CITES, IUCN, TRAFFIC, Bushmeat, Global Marine Aquarium Database.
- *Other databases*: European fauna, ITIS, Science information database.
- *Overview of the actual rules regarding conservation of biodiversity*: Convention on Biological Diversity (CBD), Millennium Ecosystem Assessment (MA), ... EU policies.
- Causes of reduction of biodiversity (mainly about the use of natural resources by humans: e.g. fisheries, tropical woodlands, ...)
- *Protection of rare species* (reduction of trade and other activities: e.g. CITES, ...)
- *Importance of biological diversity and conservation of the production of the natural resources* (e.g. examples from fisheries, tropical wood, aquarium trade (including the effects on the non-target species). Failure of the policy on fisheries, anthropogenic pressure without taking into account the ecological consequences, ...)
- *Position of Flanders, Belgium, Europe, and other continents*: comparison of the importances and conflicts; impact of the socio-economy on the sustainable use of biodiversity

**Visit to Botanic Garden Meise with presentations on the following case studies**

- Ex-situ conservation of plants and species re-introductions
- IUCN red listing of tropical tree species
- Molecular tools for identification of tropical wood to combat illegal logging
- Ecosystem services of edible mushrooms in tropical Africa as an incentive for forest conservation
- Diversity and conservation of crop wild relatives

**Student debate: the new conservation**

**Plant biodiversity conservation**

- 1 Plant biodiversity conservation: why?
- 2 Distribution of plant biodiversity
- 3 Efforts towards plant conservation
- 4 Important actors in plant conservation
- 5 Plant biodiversity conservation
- 6 Botanic gardens and conservation

- 7 Resources and tools for biodiversity conservation
- 8 Molecular tools for measuring and monitoring biodiversity
- 9 Modelling climate and ecological niches
- 10 Plant re-introductions
- 11 Invasive alien species
- 12 Conservation and use of agricultural plant biodiversity (agrodiversity)
- 13 Industrial applications of plants and their properties
- 14 Importance of plant biodiversity conservation for medicine

#### **Initial competences**

Basic knowledge on ecology and biodiversity (bachelor level)

#### **Final competences**

Students can translate their fundamental knowledge of biodiversity (genes, species, habitats) into relevant social problems (protection of rare species, invasive species, alien species and their role within ecosystems, ...) and use this knowledge to advise policy makers.

#### **Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

#### **Conditions for exam contract**

This course unit cannot be taken via an exam contract

#### **Teaching methods**

Excursion, Lecture, Independent work, Peer teaching

#### **Extra information on the teaching methods**

Lectures

Group work: students work in group on a case study

Microteaching: students present their work to the group

Excursion: Meise Botanic Garden

Independent work: preparation student debate

#### **Study material**

Type: Slides

Name: Slides'

Indicative price: Free or paid by faculty

Optional: no

Additional information: Presentations, recent literature and course materials are available via Ufora.

Type: Excursion

Name: Visit to Botanic Garden Meise'

Indicative price: € 20

Optional: no

#### **References**

Recent scientific and legal literature

Why People Need Plants (2010). Edited by C. Wood & N. Habgood. The Open

University. Kew Publishing, Royal Botanic Gardens, Kew.

Leadlay E, Jury S (eds) (2006) Taxonomy and Plant Conservation: the cornerstone of the conservation and the sustainable use of plants. Cambridge University Press, Cambridge.

#### **Course content-related study coaching**

Interactive support through Ufora, email (discussion platforms).

#### **Assessment moments**

end-of-term and continuous assessment

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

Written assessment with open-ended questions, Assignment

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

Written assessment with open-ended questions, Assignment

#### **Examination methods in case of permanent assessment**

**Possibilities of retake in case of permanent assessment**

not applicable

**Extra information on the examination methods**

Permanent evaluation: The students prepare in group (4-6 students) a case study related to a recent topic in which the knowledge of applied biodiversity is important. The students are evaluated based on the content, the oral presentation and the group activity they have performed.

Periodic evaluation:

1. The students individually prepare a policy text concerning the conservation status of a threatened species and hand in this assignment on the day of the exam.
2. Each student, on an individual basis, will formulate a written answer to a case study related with biodiversity. The student can use digital information during the exam.

**Calculation of the examination mark**

The presentation of the case study counts for 40% of the total score; the written exam for 50% of the score and the assignment for 10% of the total score.