

**Course Name: Global changes and the biodiversity crisis** 001.2.3047

**Lecturer: Prof. Merav Seifan**

**Course description:**

The modern age is characterized by global changes, primarily climate changes, accompanied by pollution and the reduction of natural areas. These changes severely deplete natural resources and disrupt their balance. One of the most crucial natural resources is biodiversity, which serves as the foundation for most of the other natural resources on Earth. Because of its pivotal role, decreasing biodiversity is not only a concern of nature enthusiasts but also has a profound impact on all aspects of human life. This includes not only our life quality but can even pose a direct threat to our physical survival. The goal of this course is to familiarize students with the essence of biodiversity and its integral role in all aspects of life on earth, as it acts as a supplier of ecosystem services and serves as a fundamental regulator for many natural processes that are under threat from global changes.

The main topics of the course will include:

- What is biodiversity and why is it important? Reflections on biological species and their definitions; biodiversity as a component of the planetary boundary concept.
- How do global processes affect biodiversity? seasonal changes and their impact on diversity; the disappearance of pollinators; invasive species; human-induced pollution; spatial fragmentation.
- Lessons from the past – previous extinctions and their causes
- The sixth extinction – what sets the current situation apart, and the latest scenarios. Potential action plans in response to global changes.

**Credits:** 2cpt

**Course Language:** English

**Final assignment:** 100%

**Reading list:**

Hannah, L. 2022. Climate change biology. Academic press.

Lovejoy, T.E. & Hannah L. (eds). 2019. Biodiversity and climate change. Yale press.

**Detailed description of the course**

1. Global changes, planetary boundaries and nature.
2. Sense and adaptability – organisms adaptation to habitat conditions and responses to modern changes
3. So why species? The biological species concept and its role in understanding natural systems
4. The biodiversity concept and its meaning
5. Extinctions and overexploitation
6. The freedom of move and spatial fragmentation
7. Awakening of spring – phenological changes caused by global changes
8. The insect apocalypse – and why should we care
9. The problem with invasive species
10. Pollution, agriculture and the fresh water crisis
11. The (pre-) history repeats itself – large extinctions along Earth history and some smaller events
12. Biodiversity and human health
13. Summary – what is going on and where can we proceed from here