Course Specifications
Valid as from the academic year 2018-2019

Plant-Water Relations in the Soil-Plant-Atmosphere Continuum (I000180)

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

Credit: 3.0
Study time: 90 h
Contact hrs: 30.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2) English
- guided self-study: 5.0 h
- lecture: 25.0 h

Lecturers in academic year 2018-2019
Steppe, Kathy
LA21 lecturer-in-charge

Offered in the following programmes in 2018-2019

- Master of Science in Environmental Sanitation: 3 crdts, offering A
- Exchange Programme in Bioscience Engineering: Land and Forest management (master's level): 3 crdts, offering A

Teaching languages
- English

Keywords
- Plant-water status, water potential, water transport, water use, drought resistance

Position of the course
The course analyses the fundamental background of water transport, considering the soil, the plant and the atmosphere as a single continuum. Water flow within this system is described in terms of water potential for both stationary and non-stationary conditions. Special attention goes to the physiological mechanisms of flow regulation and to the occurrence of drought resistance in plants. Determination and calculation of transpiration is also discussed for individual plants.

Contents

1. Plant-water relations
   1.1 The role of water in plant functioning
   1.2 Water content, water potential and components
   1.3 Water relations of cells and osmotic adjustment
   1.4 Water movement through plants and cavitation
   1.5 Water in leaves, water loss from leaves and stomatal conductance
   1.6 Water use efficiency
   1.7 Adaptations to drought
   1.8 Winter water relations and freezing tolerance
   1.9 Salt tolerance

Initial competences
Basic knowledge of plant physiology and physics within the scope of the earth science curriculum.

Final competences

1 Knowledge about the physiological and physical principles involved in water transport within the continuum soil-plant-atmosphere
2 Insight about plant characteristics leading to drought resistance and economic water use (water use efficiency)
3 Knowledge about water consumption by single plants and plant communities (crops and natural vegetation)

Conditions for credit contract

(Approved)
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
Guided self-study, lecture

Learning materials and price
Course book and hand-outs are available.
Cost: 10.0 EUR

References

Course content-related study coaching

Evaluation methods
end-of-term evaluation

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

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

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
not applicable

Calculation of the examination mark
Theory exam: periodic evaluation (100%)
Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examinator.

(Approved)