Level: master

Course title: Applied meteorology

Status: elective

ECTS: 4

Requirements: seminar work

Learning objectives

Upgraded knowledge about spatial and temporal scales of atmospheric processes and their variations. Deeper insight into processes of synoptical and local scales, energy and water balance of organisms, seasonal and climate changes and its impact. Graduate students are prepared for practical application and further improvement of their expertise.

Learning outcomes

Students are able to understand and apply different methods of atmospheric processes and processes describing atmosphere-biosphere interaction. In addition, students are able to use numerical models and different meteorological data bases. Everything that allows them to apply for position in research institutes and advisory services related to meteorology, agriculture, and environmental monitoring and protection. After finishing the master studies, students get background for further PhD studies.

Syllabus

Theoretical instruction

Climate factors and energy balance of organism. Shortwave radiation. Longwave radiation. Calculation of leaf temperature. Atmospheric humidity and precipitation. Interception. Transpiration. Evaporation from vegetated surfaces. Photosynthesis. Diffusion within forest canopy. Wind and turbulence. Turbulent transfer within PBL. Wind flow above vegetation. Wind flow within tall vegetation. Basic equations of turbulent flow. Mixing length.
Standard and urban atmosphere. Energy and water balance of urban atmosphere. Microclimate of urban layer. Climate of urban boundary layer. Urban energy balance and urban climate feedback. Models of urban atmosphere.

Practical instruction

Description of urban surfaces scheme. Setup and application.

Weekly teaching load				Other:
Lectures: 2	Exercises: 2	Other forms of teaching:	Student research: 1	