

Level: PhD				
Course title: Physics of atmospheric boundary layer				
Status: elective				
ECTS: 30				
Requirements: M.Sc. degree				
Learning objectives Introduction to physical processes in planetary boundary layer, which are important in every environmental model. Getting knowledge in modern parts of meteorology and environmental sciences.				
Learning outcomes After this course, a Ph.D. student should have knowledge on fundamental processes and equations of those processes in the atmosphere, basic principles of parameterization and their application in environmental models, ability to use technical literature and to write scientific material, and capacity to create and design environmental models and use them in practice.				
Syllabus Main characteristics of the boundary layer. Concept of environmental interface. Mathematical concept in modelling. Parametrization of heat and moisture transport in the soil. Parametrization of surface processes. Basic equations for turbulent motion. Prognostic equations for turbulent fluxes. Turbulent kinetic energy, stability and scaling. Closure theories. Boundary conditions and external forcing. Similarity theory. Measurements and simulation techniques. Mixed convective layer. Stable boundary layer. Clouds in the boundary layer. Transilient theory. Local vertical diffusion schemes in the boundary layer. Nonlocal vertical diffusion schemes in the boundary layer. Nonlocal schemes of vertical mixing in the boundary layer.				
Weekly teaching load				Other:
Lectures: 5	Exercises:	Other forms of teaching:	Student research: 15	