Level: bachelor

Course title: Air pollution transport modelling

Status: elective

ECTS: 6

Requirements: Micrometeorology

Learning objectives

Students should get fundamental knowledge of air pollution emission modelling, transport equation and techniques of measuring air pollution concentration. Students get introduced to the widely used air pollution transport models.

Learning outcomes

Students should get the basic knowledge about governing processes in air pollution transport modelling. In addition, they get the ability to understand principles of work and application of different measurement techniques and how to use the basic air pollution transport models, to apply known solutions for new problems, and to understand mathematical and numerical methods in environmental modelling. Eventually, students become qualified to work in various scientific institutes and institutes for monitoring and environmental protection, having the ability for independent work and further improvements.

Syllabus

Theoretical instruction

Natural air pollution sources. Volcanic emission of gasses and particles. Forest fire gas emission modelling. Dust and sand emission modelling. Basic of atmospheric chemistry. Chemical properties of urban pollutants. Chemical reaction of nitrogen and sulphur modelling. Acid rain. Ozone and photochemical smog. Eulerian approach to air pollution transport modelling. Dynamic meteorology system of equations. Transport equation. Turbulent mixing. Turbulent fluxes. Particle deposition. Lagrangian approach to air pollution transport modelling. Simplified transport equation. Uniqueness of transport equation solution. Analytical solution of transport equation. Experimental shape of plume cloud. Gaussian shape of plume cloud. Standard deviation ordering methods. Hot plume lifting. Puff models. Air pollution measuring techniques.

Practical instruction: Exercises

Weekly teaching load				Other:
Lectures: 3	Exercises: 1	Other forms of teaching: 1	Student research:	