

HYDRUS Short Course

March 18 - 20 2013

Program

March 18, 2013

8:30 – 9:00 Short course participants' registration & introduction

9:00 - 12:30 HYDRUS short course

12:30 - 13:30 lunch

13:30 – 17:00 HYDRUS short course

March 19, 2013

8:30 - 12:00 HYDRUS short course

12:00 - 13:00 lunch

13:00 – 17:00 HYDRUS short course

18:00 – 21:00 Common dinner for all participants (likely with beer tasting in the university brewery)

March 20, 2013

8:30 - 12:30 HYDRUS short course

12:30 - 13:30 lunch

13:30 – 17:00 HYDRUS short course

March 21-22, 2013 HYDRUS workshop
(registration for the workshop is independent of the short course)

15 min coffee breaks are included in each morning and afternoon session.

Advanced modeling of water flow and contaminant transport in porous media using the HYDRUS and HP1 software packages

COURSE DETAILED OUTLINE

Day 1:

- Lecture 1: Vadose zone flow and transport modeling: An overview.
Lecture 2: The HYDRUS-1D software for simulating one-dimensional variably-saturated water flow and solute transport.
- Computer session 1: HYDRUS-1D: Infiltration of water into a one-dimensional soil profile.
- Lecture 3: On the characterization and measurement of the hydraulic properties of unsaturated porous media.
- Lecture 4: Application of the finite element method to variably-saturated water flow and solute transport.
- Computer session 2: HYDRUS-1D: Water flow and solute transport in a layered soil profile.
- Lecture 5: Inverse modeling; application of HYDRUS-1D to laboratory and field experiments.
- Computer session 3: HYDRUS-1D: One- or multi-step outflow experiment.

Day 2:

- Lecture 6a: Application of the finite element method to 2D variably-saturated water flow and solute transport.
- Lecture 6b: HYDRUS (2D/3D) software for simulating two- and three-dimensional variably-saturated water flow and solute transport.
- Computer session 4: HYDRUS (2D/3D): Subsurface line source.
- Computer session 5: HYDRUS (2D/3D): Furrow infiltration with a solute pulse.
- Computer session 6: HYDRUS (2D/3D): Flow and transport in a transect to a stream.
- Computer session 7: HYDRUS (2D/3D): Three-Dimensional Water Flow and Solute Transport.

Day 3:

- Lecture 7: Preferential and Nonequilibrium Flow and Transport.
- Computer session 8: HYDRUS-1D: Nonequilibrium Flow and Transport.
- Lecture 8: Coupled movement of water, vapor, and energy.
- Computer session 9: HYDRUS-1D: Coupled movement of water, vapor, and energy.
- Lecture 9: Multicomponent biogeochemical transport modeling using the HYDRUS computer software packages; Introduction to the HP1 code, which was obtained by coupling HYDRUS-1D with the PHREEQC biogeochemical code.
- Computer session 10: Applications of HP1 to simple solute transport problems involving cation exchange and precipitation/dissolution of minerals.
- General session: Other applications and future plans in HYDRUS development.