About HYDRUS

The HYDRUS program is a finite element model for simulating the **one-**, **two-**, and **three-dimensional** movement of water, heat, and multiple solutes in variably saturated media. The HYDRUS program numerically solves the Richards equation for saturated-unsaturated water flow and convection-dispersion type equations for heat and solute transport. The **flow equation** incorporates a sink term to account for water uptake by plant roots. The **heat transport** equation considers movement by conduction as well as convection with flowing water. The governing convection-dispersion **solute transport equations** are written in a very general form by including provisions for nonlinear nonequilibrium reactions between the solid and liquid phases, and linear equilibrium reaction between the liquid and gaseous phases. Hence, both adsorbed and volatile solutes, such as pesticides, can be considered. The solute transport equations also incorporate the effects of zero-order production, first-order degradation independent of other solutes, and first-order decay/production reactions that provide the required coupling between the solutes involved in the sequential first-order chain.

Information

When:
15.–16.07.2025, 9:00–16:00

Where:
Meißer-Bau, Gustav-Zeuner-Straße 12, 09599 Freiberg
Raum MEI-1203a (1st floor)

Registration fee:
TUBAF members 30 €
External 130 €

What's included:
Two full days of HYDRUS lectures and exercises; coffee breaks are included; lunch is excluded

Registration:
Possible until July 4th via ricarda.eckner@geo.tu-freiberg.de

Deregistration:
Possible until July 10th without charge; in the event of later cancellation or non-attendance at, the full fee must be paid.

Further information:
The course will be held in **English**.

You do not have to bring your own laptop. The course will take place in the **PC-Pool** of the Meißer-Bau.

TUBAF
Die Ressourcenuniversität.
Seit 1765.

ZeWaF

Workshop

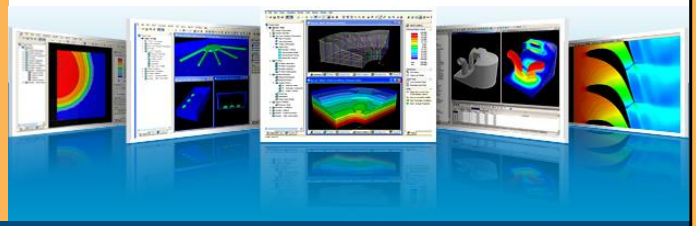
Introduction to Hydrus: Hands-on Workshop

15.–16.07.2025
Freiberg

Zentrum für Wasserforschung Freiberg
Winklerstraße 5 | 09599 Freiberg
https://tu-freiberg.de/zewaf

Goal of the workshop

This course provides an introduction to HYDRUS, covering its theoretical background and practical applications. Participants will explore the GUI, engage in hands-on exercises, and work through examples such as one-dimensional water infiltration, drip irrigation, and flow to a stream. Advanced modeling of three-dimensional water flow and solute transport is also included. By the end, attendees will have a solid understanding of HYDRUS and its capabilities for hydrological modeling.



About the referee

M.Sc. Lúcia Pedrosa

Doctoral researcher at TU Bergakademie Freiberg. Background studies are Engineering Geology and Master of Hydroscience and Engineering. In my research, I use numerical models of flow and solute transport to solve problems regarding unsaturated and saturated zones.

Programme

Tuesday, 15.07.2025

9:30 – 9:45 Welcome & Introduction

9:45 -10:30 Overview of Hydrus: Theory and applications

10:30 -10:45 Break

10:45 – 12:00 Tour of the GUI & capabilities

12:00 – 13:00 Lunch

13:00 – 15:00 Hands-On Example 1: 1D Infiltration and Solute Transport

15:00 – 15:30 Break

15:30 – 17:00 Modifying example 1: Scenario Testing

Programme

Wednesday, 16.07.2025

9:30 – 10:00 Recap & Discussion

10:00 – 11:00 Hands-On Example 2: Drip Irrigation (2D)

11:00 – 11:15 Break

11.15 – 13:00 Hands-On Example 3: Flow Transport to a Stream (2D Transect)

13:00 – 14:00 Lunch

14:00 – 15:30 Hands- On Example 4: Water and Solute transport

15:30 – 15:45 Break

15:45 – 16:30 Troubleshotting & Best Practices