

# Guidelines PhD School Water Earth Systems

## 1. Aims & Concepts

The aim of the PhD school is to provide a stimulating research environment for students working on the water-related topics in various earth systems. The PhD school is intended for students that investigate the role and behavior of water in Earth systems and its chemical and microbial quality at a wide range of spatial scales reaching from hillslopes within catchments, shallow aquifers, deep geothermal reservoirs to large regional flow systems and catchments. The PhD school aims at training highly-qualified researchers that master cutting edge research approaches, are capable of carrying out innovative research in a multidisciplinary context, acquire a broader understanding of the role of water in earths systems, and have a strong set of general research and communication skills.

The PhD school brings together research groups with complementary expertise from several institutions across Switzerland. A specific emphasis is given to advanced methods for characterizing the geological and geomorphological framework that governs the flow of water and transport of substances, interactions among environmental systems (e.g. groundwater-surface water; groundwater-ecosystems), and improved understanding of coupled processes (e.g. thermal-hydro-mechanical-chemical coupling). In addition, activities that integrate data with models are favored.

Different types of activities are offered:

- **General research and communication skill courses:** In this activity, students are introduced to general research and communication skills such as project management, scientific writing skills, presentation skills or proposal writing.
- **Courses:** Courses that foster process understanding and introduce advanced methods are organized each year. A special emphasis is given to quantitative methods applicable in different fields (e.g. (geo)statistical methods, inverse methods), methods that integrate different types of processes (e.g. coupled hydro-mechanical-chemical processes), courses that integrate experimental approaches with advanced theory (e.g. use of isotope effects for process elucidation) or courses on feedbacks and interactions between different natural systems (e.g. groundwater and surface water). Courses typically include a part with hands-on exercises (e.g. computer labs) and activities/discussions on how the course content relates to the PhD projects of the participants. The courses will be taught in collaboration between researchers of partner institutions with guest lecturers.
- **Field camps:** In this activity, PhD students will learn new field methodologies bridging across disciplines such as soil physics, hydrogeology and hydrology as

well as methods for geophysical and sedimentological characterization of the subsurface. The courses typically include hands-on activities at the research sites of the participating institutions.

- **Workshops:** In these workshops senior researchers from participating and external institutions meet with PhD students to debate a specific broader topic within the domain of the PhD school. Workshops can have a different orientation e.g. reviewing the state of the art in a certain research area or may focus on 'hot topics' from a societal point of view to debate how science can contribute to resolving them. An important objective is thereby to foster the ability of PhD students to put their research in a larger scientific or societal context. Workshops are also intended to favor integration among the participating institutions. They may be combined with the PhD student conference.
- **PhD student conference:** In the one day PhD student conference all participating PhD student present their work in form of oral or poster presentations. The PhD school will be self-organized by the PhD students in collaboration with the PhD school coordinator. The goal is to increase exchange and interdisciplinary collaboration between the PhD students during a more informal context, and to receive feedback from PhD students of different disciplines and institutions.
- **Seminars:** PhD students will organize and attend regularly seminars at UNINE where they present and discuss their research. Apart from practicing presentation skills, they foster informal exchange among PhD students. The seminars are also attended by professors and senior scientists, which provide students feedback. The PhD student presentations (typically weekly) are completed with guest seminars (typically monthly).

**Typically activity volume:**

Type	Number per year	Duration Days
General research and communication skills	2	2
PhD student conference	1	1
Course	2	3-4
Field camp	1	4
Workshop	1	1

The courses are open for external PhD students which have however to pay a course fee that reflects the effective costs per participant. The students participating in the PhD school also have the possibility to follow courses elsewhere.

## **2. Mode of participation & registration**

### **Mode of participation**

The involved institutions and research groups can choose between two modes of participation:

- Full participation (students from UNINE): PhD students participate in the activities throughout their PhD and acquire the necessary ECTS points according to the rules defined in this guidance document
- Partial participation (students from UNILE, EAWAG, ETHZ and UNIBAS): PhD students only follow selected activities as they are registered in other programs at their home institution. They can use the acquired ECTS points towards their home institution program.

### **Registration**

Before applying to the PhD School Water Earth Systems Program, candidates must have themselves arranged for a research laboratory, thesis director, and be register at one of the following the universities :

- University of Neuchâtel
- EAWAG
- University of Lausanne
- University of Basel
- ETHZ

The coordination office of the PhD School WES does not handle any matters concerning the registration with the University. This is an administrative matter which is handled by the University registration office.

To register for the PhD School WES, the students have to complete the registration form on the PhD school website (<https://www.unine.ch/phdschool-wes/home.html>) when they start their Ph.D. By registering they accept the guidelines of the PhD School WES and that their name and professional email address appear on the PhD school website.

### **3. Obligations**

#### **Participation and ECTS**

The participation to the PhD School conference is required for all students of the PhD school (both full and partial participations). Then for PhD students that are fully registered in the PhD school, a minimum of 12 ECTS credits must be acquired by the end of the PhD (4 years, around 3 ECTS/year). If the PhD period is shorter than 4 years, the number of credits required is lower proportionally.

Credits are gained through participation to activities organized by the PhD school and external activities as listed below. For each activity, the number of ECTS that PhD students receive is indicated when the course is announced. As a general rule, for courses and field camps, the students receive 1 ECTS per two days, for activities that required more extensive preparation (PhD conference, workshop), 1 ECTS per one course day.

At the end of each activities, students will fill out a course evaluation form to verify that the courses meet their needs and maintain a high quality.

#### **Evaluation of student participation**

PhD students are expected to be highly motivated to participate in courses independent of a final evaluation of their participation. Nevertheless, the student participation is evaluated for each activity. The objective is mainly to verify that PhD students can apply the presented concepts to their research. Thus, the evaluation also provides additional feedback to lecturers. Depending of the type of activity, the evaluation can take different forms, for example:

- PhD conference and workshops: Presenting a poster or giving a talk
- Field camps: Preparation and implementation of a data acquisition strategy and a critical evaluation or first interpretation of the data in the form of a report or presentation
- Courses: Presentation and discussion on how the methods and tools presented in the course can benefit their own research by providing concrete ideas how these new methods will be implemented in their research
- General research and communication skills: Immediate practicing and implementing of the presented strategies and approaches during the course using their own examples.

#### **Credits for external activities**

Fully participating PhD students can also acquire credits with external activities, such as:

- Participation in activities of other PhD schools
- Participation in international conference with oral or poster presentation
- Participation in activities to transfer knowledge to the wider public (e.g. "fête des sciences, café scientifique) with presentation or panel discussion

#### **4. Structure and organization of PhD program**

##### **Program committee**

For the structuring and implementation of the doctoral program, a doctoral program committee is appointed. This program committee consists of the following members:

- The director of the program  
Prof. Philip Brunner (UNINE)
  
- The program coordinator  
Marie Arnoux (UNINE)
  
- Members of each participating institution  
Prof. D. Hunkeler, Hydrochemistry and Contaminants (CHYN)  
Prof. P. Perrochet, Quantitative Hydrogeology (CHYN)  
Prof. assoc. P. Renard, Stochastic Hydrogeology (CHYN)  
Prof. Steven Miller, Geothermics and Geodynamics (CHYN)  
Prof. ass. B. Valley, Geothermics and Reservoir Geomechanics (CHYN)  
Prof. Mario Schirmer, Contaminant/ urban/ alpine hydrogeology (EAWAG)  
Prof. Niklas Linde, Hydrogeophysics/Inverse theory (UNILE)  
Prof. Peter Huggenberger, Hydrogeology/ Sedimentology/ clastic sediments/  
urban geology (UNIBAS)  
Prof. Jan Seibert, Catchment hydrology/ Impact of climate change on water  
resources (ETHZ)
  
- Two Ph.D. student representatives

Each participating institution delegates one member to the program committee. The PhD student representatives are elected by the PhD students for two years (one is from UNINE and one from another institution member). The director of the program and the coordinator are appointed by the committee. The coordinator has a PhD degree.

The committee sets guidelines for the structuring and functioning of the doctoral program, defines the activities of the PhD school, approves the budget and ensures quality control. The committee meets as often as necessary upon invitation by the director of the program (at least once a year). Meetings can also take place upon request of two other members of the committee. Decisions are taken by simple majority voting. In case of parity of votes the vote of the director is decisive.

##### **Role of the coordinator**

The coordinator is employed at 20% and has the following tasks:

- Coordination and support for organizing PhD school activities
- Monitoring quality control of PhD school activities

- Monitoring of PhD student participation and acquisition of credits
- Preparation of committee meetings
- Reporting to participating institutions and funding bodies

### **Organization of courses**

For each proposed activity, a responsible person from a participating institution is defined. The person prepares a draft program of the activity that is submitted to the program committee and other interested parties for comment. The person organizes the activity in close collaboration with the program coordinator.