

Sciences du Sol

ENV-222

Prof. Géraldine Bullinger
Prof. Gabriele Manoli

Outline

- **Course Information**
- **Introduction by Prof. Bullinger** (recorded)

Language: French/English*

*Part of the course is taught in **English** but in Moodle you can find material in French as well as English-French translations.

Teaching staff

- Coodinators: Prof. Géraldine Bullinger, geraldine.bullinger@hefr.ch
Prof. Gabriele Manoli, gabriele.manoli@epfl.ch
- Assistants: Fiona Jetzer, fiona.jetzer@epfl.ch
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- Computer Lab: Guo-Shiuan Lin, guo-shiuan.lin@epfl.ch

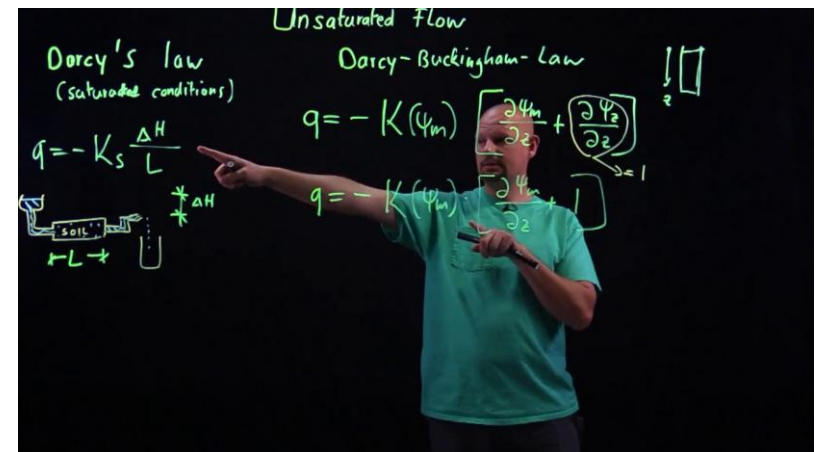
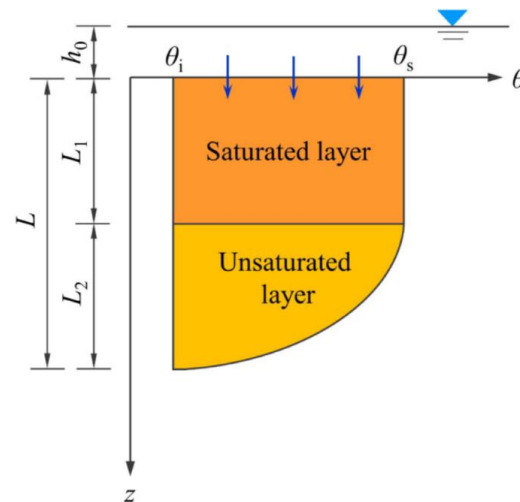
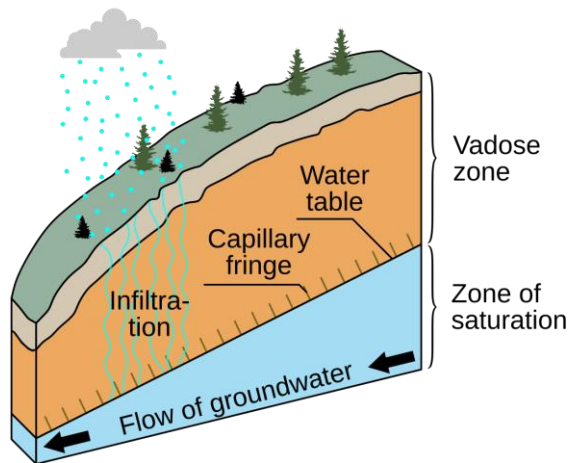
Course objectives (I)

- Describe the different components of soil and how they interact.
- Explain the properties of soil.
- Identify some types of soil in Switzerland and explain how they are formed.
- Describe the ecosystem functions of soil.
- Focus on the production function and study the physical, chemical and biological fertility of some types of soil.

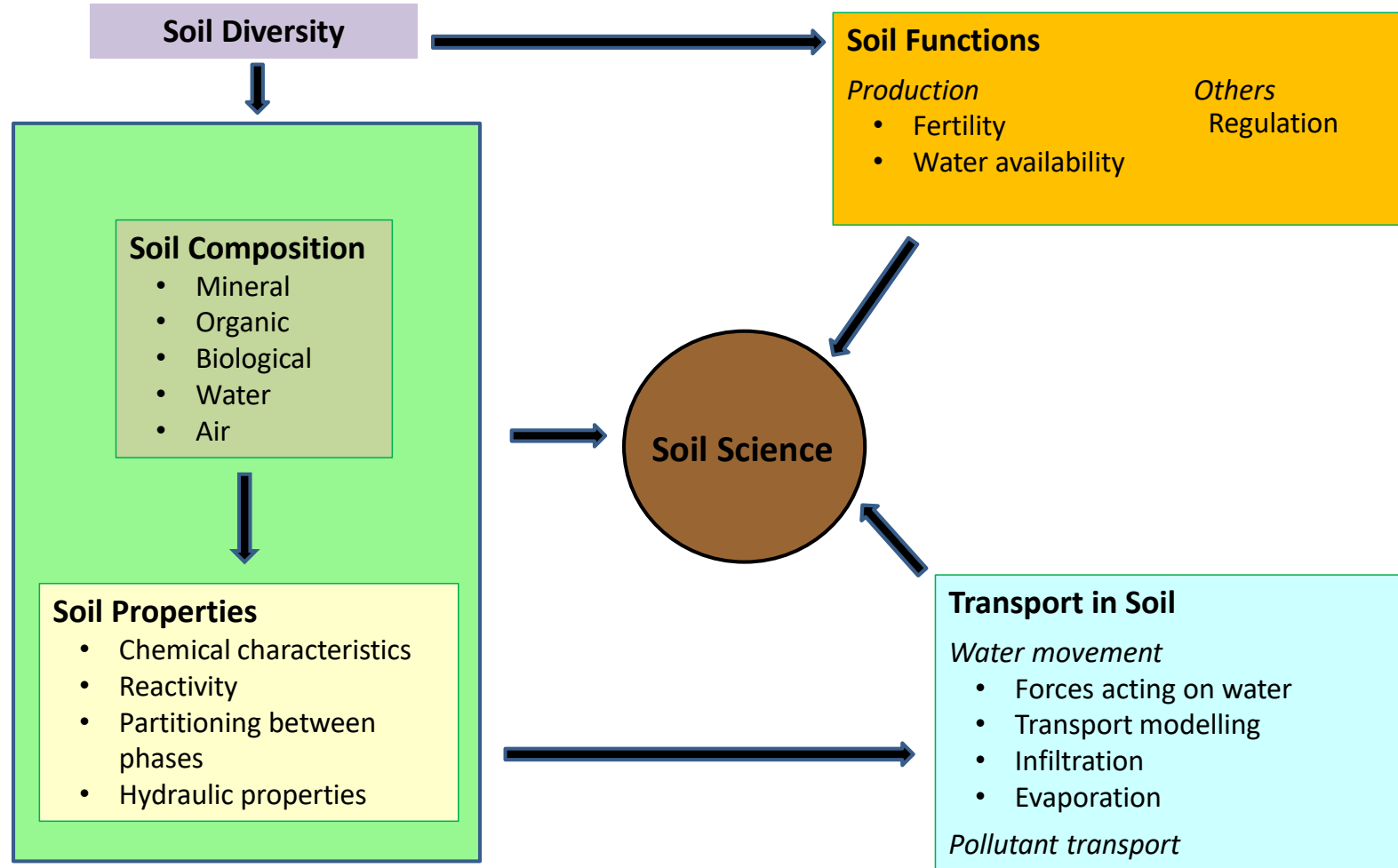


Course objectives (II)

- Gain an understanding of the fundamental concepts of soil physical and hydraulic properties;
- Learn how to model water movement in the soil (saturated and unsaturated conditions)
- Solve complex problems related to soil-plant-atmosphere processes



Course Info: Mind Map



By the end of the course, you will be able to:

- Recall basic soil science knowledge.
- Handle and describe soils in situ.
- Formulate hypotheses about the occurrence of soil processes and assess soil fertility.
- Model water infiltration, evaporation and runoff in soil.
- Link theory and practice.



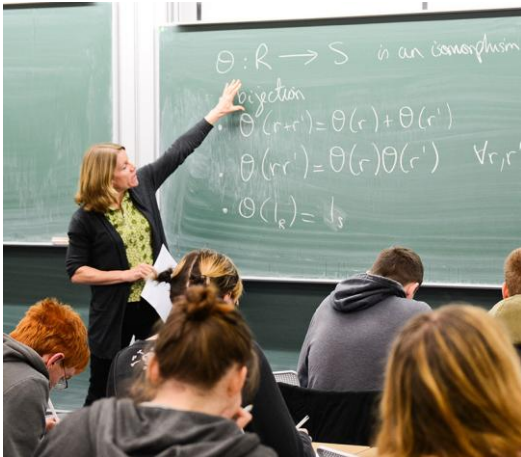
Soil scientist, <http://soils.usda.gov>

Key references

- Slides (in *English*) and notes (in *French*) available in Moodle
- Gobat et al., *Le sol vivant*, 2010 ou *The living soil*, 2004.
- Gobat et Guenat, *Sols et paysages*, 2019.
- Calvet R., *Le sol*, 2013.
- Hillel D., *L'eau et le sol*, Ed. Vander, 288 p., 1974.
- White R., *Principles and practice of soil science*, 2005.
- Jury, W. A., & Horton, R. (2004). *Soil physics*. John Wiley & Sons.
- Hillel, D. (2003). *Introduction to environmental soil physics*. Elsevier.

Format

- **Lectures** (Wednesdays, Bullinger/Manoli): *blackboard and projected material*
- **Exercices** (Mondays/Fridays, assistants): *complete exercises in class*
- **Travaux pratiques** (Mondays/Fridays, assistants):
 - **Field work:** *list of groups (A & B) and subgroups of 3-4 students in Moodle.*
 - **Computer Lab:** *modeling assignments in groups of 2-3 students, see Moodle*



Schedule & Rooms

- **Wednesdays:** GR B 330, 10h15-12h00 (lectures)
- **Mondays:** CE 1 14, 9h15-13h00 (depending on activity and groups)
- **Fridays:** MED 2 2423, 14h15-18h00, (depending on activity and groups)

Check detailed schedule and info in [Moodle](#)

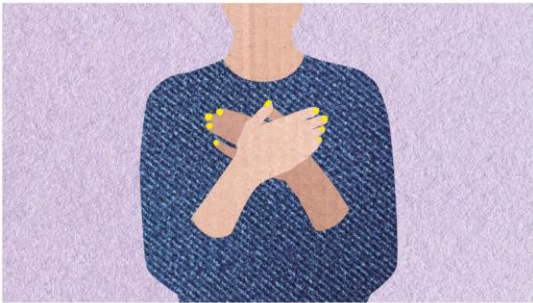
Sem. cours	Date (jour)	Heure	Groupe A	Groupe B
En rouge : Exercices En vert : Travail pratique G. Bullinger En bleu : Travail pratique G. Manoli En violet : Temps libre pour travail sur rapports				
S. 1	2025-09-08 (lundi)	09.15-13.00	---	
	2025-09-10 (mercredi)	10.15-11.00 11.15-12.00	Cours : présentation (GM) / introduction (vidéos pré-enregistrées - GB)	
	2025-09-12 (vendredi)	14.15-15.00 15.15-16.00	---	
S. 2	2025-09-15 (lundi)	10.15-11.00 11.15-12.00	10h15-12h00 : cours constituants minéraux	
	2025-09-17 (mercredi)	10.15-11.00 11.15-12.00	Cours : constituants minéraux/organiques	
	2025-09-19 (vendredi)	14.15-15.00 15.15-16.00 16.15-17.00 17.15-18.00	TP terrain 1 : initiation+sondages	Exercices 1

	Task	Assessment Value
1.	Fieldwork report (group) <i>Write a short report on the fieldwork activities carried out during the first part of the course</i>	15%
2.	Computer Lab Report (group) <i>Write a short report on the modeling activities carried out during the Computer Laboratory sessions</i>	15%
3.	Exam (individual) <i>Open and/or multiple-choice questions + exercises on the material covered during the course</i>	70%

Further information and deadlines in [Moodle](#)

- **“Get to know your classmates”**: you will work in groups during the computer lab but it is important that you stay in touch with your classmates
- **“Three-Before-Me” rule**: You must seek out at least three avenues to obtain information regarding a question or problem you are having before you ask me ... chances are, someone in the class may have the answer!
- **Searching for info?** Check this out: <https://graphsearch.epfl.ch/>
- For any issue, send me an email, I’ll reply as soon as possible (hopefully within 3-4 days but **be patient** if it is not urgent).
- Set some **ground rules for your team** (tasks, deadlines, regular meetings, etc)
 - e.g. “sign” a team contract: <http://www.learnhigher.ac.uk/working-with-others/group-work-working-with-others/ground-rules-for-group-work/>

Tips & “rules”



Self-respect

At EPFL, we want to ensure that staff, students and researchers can get the psychological help and support they need to achieve their full potential. Find details of the mental health and well-being services available to EPFL community members.



Respect for others

EPFL's strength is rooted in its extraordinary diversity. Consideration that we show for each other is an indicator of our own worth. Do not remain indifferent in the event of harassment, violence or discrimination.



Respect for the environment

Sustainability is a priority that manifests itself on many levels at EPFL, transversally, through campus operations. This networking also relies on the commitment of each and every one of us to make our school a healthy place.



<https://www.epfl.ch/about/respect/>



Trust and Support Network

The Trust and Support Network (TSN) offers listening, guidance and support in complete confidentiality. It is composed of internal and external instances with a mandate to provide assistance in situations related to psychosocial risks.