

Soil Hydrology (Basic)

Prof. Nunzio ROMANO		(e-mail) nunzio.romano@unina.it (phone) 081-2539421	
Number of CFU: 4	Activities	Lectures	(hours)
		Laboratory	(hours)
		Seminars	(hours)
		Other activities (please indicate the activity)	(hours)

Objectives

This course is a basic dive into the world of soil hydrology and addresses topics that help the students gain a wider view of monitoring and modeling environmental systems. Soil hydrology includes the descriptions of the physical and hydraulic aspects of a soil system as well as of transport processes into the soil-vegetation-atmosphere continuum. Advanced measurement techniques and tools will be reviewed for data collection and interpretation. Hands-on activities and the use of computer models will complement this course.

Learning outcome

By the end of this course, students is expected to be able to:

- Understand the fundamentals of soil hydrology;
- Identify and experimentally quantify key soil physico-chemical and hydraulic properties of importance for water balance and environmental protection;
- Interpret the outcomes from experimental tests and computer simulations, and draw appropriate conclusions;
- Combine and apply the concept of soil hydrology to other environmental disciplines.

Topics (with the indication of the n of hours/topic)

CFU1: The earth's critical zone and soil hydrology. The functional meaning of soil and soil-water relationships. Other soil properties.

CFU2: Soil water content and potential: definitions and measurements. The movement of water in soil and soil hydraulic properties.

CFU3: Basic hydrologic processes. Water balance in the soil-vegetation-atmosphere system.

CFU4: Laboratory tests and use of computer models.

Evaluation: oral exam.

Recommended readings

Hillel, D. 1998. Environmental soil physics. Academic Press, New York.

Kutilek, M., D.R. Nielsen, 1994. Soil hydrology. Catena Verlag, 370 pp., ISBN: 3923381263

Lazarovitch, N., A.W. Warrick, 2013. Exercises in soil physics. Catena Verlag GMBH, Reiskirchen, Germany, 352 pp., ISBN: 978-3-93381-60-9.

Radcliff, D.E., J. Šimůnek, 2010. Soil physics with HYDRUS. CRC Press, Taylor & Francis Group, New York, 373 pp., ISBN-13: 9781420073805.