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**ACADEMIC YEAR: 2016-2017**

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COURSE: Agricultural and Forestry Basin Hydrology

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TYPE OF EDUCATIONAL ACTIVITY: Characteristic

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TEACHER: Antonio Coppola

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Phone: 0971 206120

mobile:

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Language: Italian

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ECTS: (lessons / tutorials/practice): 10 (8 frontal lectures; 2 practice)	n. of hours: 64 hours lectures 32 hours practice	Campus: Potenza School: SAFE Program: LM Forest and Environmental Sciences	Semester: I & II
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#### EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course will deal with all the main physical processes involved in the hydrologic cycle at the soil surface and the subsurface. The main aim will be to provide basic tools to determine the hydrological parameters for the management and the protection of the water resources in the agricultural and forestry basins.

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#### PREREQUIREMENTS

- LT (3-year degree): Physics; Agricultural and Forestry Hydraulics

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#### SYLLABUS

##### Lessons

The hydrographic basin; The hydrologic cycle; Hydrological balance; Rainfall measurements and statistical analysis; The water in natural porous media: Soil Physical and Hydrological properties; Measuring the soil hydrological parameters: Measurement methods of the soil water potential and the soil water content; Water flow in saturated and unsaturated porous media: Darcy's law for steady-state water flow; Measurement methods for the hydraulic conductivity; Richards' equation for transient water flow; Evapotranspiration: Sensors; Measurement methods and data analysis; Mathematical models for estimating root water uptake; Groundwater resources; Piezometers; Wells, Groundwater recharge; Surface Runoff: Formation and propagation of the runoff; Runoff Hydrographs; Discharges: Measurement methods and statistical analysis; Solute Transport in natural porous media: Advection-Dispersion Equation; Stochastic-Convective models; Measurement methods of hydrodispersive parameters; Groundwater resources protection: Evaluating soil and groundwater resources vulnerability to point - and diffuse-pollution sources

##### Practices

Monitoring hydrological parameters and data analysis for the calculating the hydrological balance at the plot-scale;

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#### TEACHING METHODS

64 hours of lessons 32 hours of laboratory and field practices. During practices students will be asked to calculate the hydrological balance for an experimental field

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#### EVALUATION METHODS

Oral examination at the end of the course. Three questions, one of which related to topics addressed during practices.

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#### TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Teaching material distributed in classroom and available on-line
  - Cavazza L. - Fisica del terreno UTET Torino;
  - Jury W. - Soil Physics
  - Nebbia G., Ippolito G., Russo Spena A., Viparelli M. - Dispense di Idraulica
  - Maione U. - Dispense di Idrologia
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- Vieux B.E. – Distributed hydrologic modeling using GIS

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**INTERACTIONS WITH STUDENTS**

- in the office at planned days/hours (usually on Wednesday)
  - e-mail
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**EXAMINATION SESSIONS (Forecast)**

Usually the third Wednesday of every month (except August)

**EVALUATION BOARD**

Antonio Coppola  
Alessandro Comegna  
Paola D'Antonio

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**SEMINARS BY EXTERNAL EXPERTS** YES

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