

ACADEMIC YEAR: 2018-2019

COURSE: Remote sensing applied to water resources monitoring

TYPE OF EDUCATIONAL ACTIVITY: Optional

TEACHER: Antonio Coppola

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mobile:

Language: Italian

ECTS: (lessons / tutorials/practice): 10 (8 frontal lectures; 2 practice)	n. of hours: 32 hours lectures 16 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 remote sensing techniques applied to the hydrology of agro-forestry basins. It will mostly focus on the main techniques for estimating state variables (temperature, soil surface water content, water quality, vegetation cover and surface roughness) and fluxes (evapotranspiration) of hydrological interest.

- **Knowledge and understanding:** the course provides the general principles on the main techniques and sensors for remote sensing of state variables and fluxes of interest for agricultural and forestry hydrology.
- **Applying Knowledge and understanding:** the skills acquired in the course will be supported by laboratory activities mostly devoted to the use of the main freeware softwares (QGIS, ESA SNAP) applied to soil water content and evapotranspiration estimation.
- **Making judgements:** The student will gain the ability to identify and apply the most suitable remote sensing techniques and sensors to solve hydrological problems at basin scale
- **Communication skills:** The student will acquire the terminology and technical language related to remote sensing and will be able to transfer the skills gained during the course in agricultural and forestry hydrology applications
- **Learning skills:** The student will be able to organize logically all the information coming from the course, by identifying time after time the most suitable tools to face issues related to the remote sensing of water resources in agricultural and forestry basins, and integrating them with information coming from the relevant literature

PREREQUIREMENTS

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

SYLLABUS

Lessons

CFU-1: Surface temperature estimation with thermal infrared data. Estimation of the shallow soil layer water content by using microwaves;

CFU-2: Estimation of the surface water quality by using visible and infrared data. Estimation of the surface roughness with lidar data;

CFU-3-4: Estimation of evapotranspiration fluxes;

Practices

CFU 5: Use of the main software freeware (QGIS, ESA SNAP) for analyzing satellite images

TEACHING METHODS

32 hours of lessons 16 hours of laboratory and field practices. During practices students will be asked to apply the skills acquired during the course



EVALUATION METHODS

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

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Teaching material distributed in classroom and available on-line
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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

Angelo Nolè

Agostino Ferrara

Francesco Ripullone

SEMINARS BY EXTERNAL EXPERTS YES
