Data Measurement and Acquisition

1. **Course number and name:** 020MEAGS5 Data Measurement and Acquisition

2. **Credits and contact hours:** 2 ECTS credits, 1x1.25 hours

3. **Name(s) of instructor(s) or course coordinator(s):** Cynthia ANDRAOS

4. **Instructional Materials:**

    a. Class notes prepared by Sélim CATAFAGO

    b. Class notes prepared by Wajdi NAJEM

    c. World Meteorological Organization, Guides des pratiques hydrologiques, OMM-N°168.

5. **Specific course information**
    a. **Catalog description:** Familiarization with the characteristics associated with devices, sensors and time series measurements, as well as with the relevance and accuracy of the measurements. Provide the necessary elements to: Understand the hydrological measurement sequence, design systems for measurement of atmospheric water (rainfall, snowfall, evaporation…), choose the site and design hydrometric stations on rivers and select the adapted equipment for these stations.

    b. **Prerequisites or co-requisites:** None

    c. **Required:** Required course for Water and Environment Specialty students.

6. **Educational objectives for the course**
    a. **Specific outcomes of instruction:**
        - Introduce the students to the concepts of data measurement and acquisition
        - To be able to design a climatic station
        - To be able to choose a site, and design a hydrometric station
        - Enhance the students' writing and oral presentation skills
        - To be able to apply the norms and standards of measurement
        - Undertake the study of specific problems related to pressure and flow measurements
        - Design a measurement system including the selection and installation of meters.

    b. **PI addressed by the course:**

PI	1.4	2.1	3.2
Covered	yes	yes	yes
Assessed			

7. **Brief list of topics to be covered:**

Part I: Hydrologic Measurements

- **a.** Hydrologic measurement sequence
- **b.** Measurement of precipitation
- **c.** Measurement of Evaporation and Evapotranspiration
- **d.** Flow measurements and rating curves
- **e.** Measurements of other hydrological parameters

Part II: Hydraulic Measurements

- **f.** General information on measurements
- **g.** Hydrostatic Methods
- **h.** Velocity and Flowrate Measurements Using Pressure-Based Devices
- **i.** Velocity and Flowrate Measurements Using Non-Pressure-Based Devices
- **j.** Types of Meters
- **k.** Communicating Meters
- **l.** Practical Considerations Related to Meters