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DBL example activity in Hydraulic Engineering

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Course description

The students follow a MSc in Hydraulic Engineering . This subject is optional and taught in the 2nd semester. On the 18th May 2022 the activity is taken in the laboratory, named as Interpreting water level measurements in a prismatic flume activity and is developed some weeks after that activity in an online form.

Prerequisites : Students must know how to measure water level in a channel and some basic hydraulic concepts.

Material needed to follow the course: laboratory flume, sensors, water level profiles measurement tools, a personal computer.

Learning outcomes

The objective of the approach is to let students discover by examining the water level profiles obtained at a water level sensor the test conditions (larger/smaller input volume; gate openings).

The objective is also to make them understand how calibrate a measurement sensor and how to deal with water level profiles measurement techniques.

Student's activities

The students work in a collaborative form in the laboratory extracting data from the measures taken, guided by the teacher and sowing how to use lab instruments and sensors.

The second part of this activity consists in the arrengement of the water level measures taken, in which the teacher will answer any questions they may have.

Support from the teacher is maintained through emails and chats, ongoingly and on-demand.

During the process, the teacher will act as a guide by asking questions with open answers and letting them find a solution and learn from their own mistakes. The purpose is also to assess their understanding of the scripts and to facilitate knowledge transfer in a real-world situation. Once the students find a possible solution, the teacher will validate it. Optionally, the students could present their solution to the rest of the class.

Evaluation

Evaluation is about assessing how learning outcomes were achieved by each student answering the following questions:

- Are sensors 1 and 2 in the same position with respect to the intermediate gate?
- Is the position of the sensors maintained f or the different datasets?
- Which tests were performed with the intermediate gate totally open?
- Which tests were performed with the intermediate gate partially closed
- By comparing water level measures with the same configuration of the intermediate gate, can you state in which case the inlet volume was higher?.

Course designing

The SFLM machine is not applicable as a support for designing this course because the source files are not proper to the SFLM machine.

This course uses the following active learning component:

- Practice
- Dataset treatment
- discussion: students will respond to the questions from the teacher or from their peers.

Checklist

- Does the problem revolve around the same topic? Yes, all is about hydraulic measurement techniques.
- Is the topic appealing to the students? Yes as other subjects.
- Is the approach of the problem close to a real-life situation? Yes, it's directly pulled from it.
- Do the students have to do any previous work before the lesson? Yes, read hydraulic measurement techniques and concepts.
- Do the students have the previous knowledge required to solve the problem? Yes, it has been worked in the previous lessons.
- Does the problem statement or report given to the student contain all the necessary information to solve the exercise? Yes, they'll just have to take measures and follow the course activity.
- Is the dataset given to the students with the problem statement? No, the teacher gives the problem statement and the students collect themselves the dataset.
- Does the course script contain all the information required to follow the lesson? Yes
- Does the course script consider the previous knowledge that the students may have? Yes
- Is the course script easy to follow without misinterpretation? Yes

- Are all the tools and equipment required for the lesson described in the course script? Yes