

Erasmus+ ICM Region 9 Subsharan Africa
University of Makerere / E10208766, Kampala, Uganda (MUU),
Dept. of Civil and Environmental Engineering (CEE), School of Engineering, College of
Engineering, Design, Art and Technology (CEDAT)
Dept. of Geology and Petroleum Studies, College of Natural Sciences (CoNAS).
University of West Attica (UniWA) / G EGALEO02, Dept. of Civil Engineering

Contacts

Moderator at MUU - Assistant Professor (Lecturer) **Dr. Seith MUGUME**, Dept. of Civil & Environmental Eng.

Associate Prof. Arthur Godfrey BATTE, Dept of Geology and Petroleum Eng.

Dorothy Okello, Dean, School of Engineering at Makerere University

Moderator at UniWA – Prof. **Marios VALAVANIDES**, Dept of Civil Engineering

Preamble

A teaching mobility of Dr. Seit Mugume at the University of West Attica (UniWA), School of Engineering took place on July 2022. He met with two faculty members from the Dept. of Civil Engineering, Prof. Marios Valavanides (Hydraulics) and Assistant Prof. George Belokas (Geotechnical Engineering). The three faculty members discussed matters of common research interest with respect to Hydraulics and Hydraulics Works from the perspective of Geotechnics and Environmental Impact Assessment. The three members concluded on looking forward into future collaboration.

In the following years, Professor K. Nikas, Dept. of Mechanical Engineering, UniWA, visited the Dept of Mechanical Engineering, CEDAT, MUU and consulted on the improvement of the resident laboratory of Fluid Mechanics (CEDAT).

Following-up on Dr. Mugume's visit at UniWA, Prof. Marios Valavanides, had a teaching mobility at the Makerere University from 7 to 13 November, 2024.

On-going communication

During the teaching mobility visit, Prof. Valavanides provided lectures to undergraduate students of the CEE Dept., College of Engineering, Design, Art and Technology (CEDAT), hosted by Dr. Seith Mugume, see Fig. 1 and linkedin posts https://www.linkedin.com/posts/makerere-school-of-engineering_fluidmechanics-porousmedia-erasmusplus-ugcPost-7262020271610466304-8lx3?utm_source=share&utm_medium=member_desktop and postgraduate students of the Dept. of Geology and Petroleum Engineering, College of Natural Sciences (CoNAS), Fig. 4, hosted by Dr. Arthur Batte, Senior Lecturer, <https://cns.mak.ac.ug/index.php/personnel/dr-arthur-godfrey-batte-phd/> .

In his lectures he presented educational video recordings of hydraulic phenomena reproduced and captured at the Laboratory of Hydraulics, Dept. of Civil Eng., UniWA. He addressed basic mechanisms of fluid flow in porous media. principles under the title "Fluid Mechanics at small scales: Dynamic relative permeability's in two-phase flows in porous media – Recent progress and open research problems".

During his week visit, Prof. Valavanides had a full guided tour by Dr. Mugume to the premises of the Makerere Campus, Fig. 3, and was introduced to administration faculty members, Prof. Dorothy Okelo, Dean CEDAT. He also visited the laboratories of Fluid Mechanics, Dept. of Mechanical Engineering and Hydraulics, Dept. of Civil and Environmental Eng., Fig. 2. In that context Prof. Valavanides and Dr. Mugume considered the possibility of enriching the educational material with complementary material to be captured and developed at the CEE Hydraulics Lab, and also in translating from Greek to English the

electronic textbook “Laboratory Hydraulics” authored and produced by Valavanides, in order to be used by the students at CEDAT/ MUU.

Valavanides and Mugume exchanged ideas on research collaboration with Dr. Mugume on Hydraulics and Flow in Porous Media. Moreover he reflected on the options of educational collaboration through engaging a postgraduate student (Dorothy Adeke) to consider working on her thesis on a research project at UniWA under the Erasmus+ ICM mobility scheme. Mrs. Adeke, is one of Dr. Mugume postgrad students, and has recently completed her undergraduate studies at CEDAT/MUU with excellent grades. She has experience in developing machine learning models for simulating flows in open channel drainage systems using Python programming language and she has applied for admission to the MSc in Civil Engineering at Makerere University. She is interested in engaging in a collaborative research project (ImproDeProF) at the Laboratory of Hydraulics under the supervision of Prof. Valavanides. The proposed task subject will be on examining a large number of snapshots of biphasic flow patterns in model pore networks by applying Machine Learning (ML) and big data methodologies. To this end, she has applied for an Erasmus+ ICM exchange program grant between Makerere University and University of West Attica, Greece. Foreseen visit is on spring 2025.

The faculty members at CEE/DEDAT are very much looking forward into fostering our academic and research collaboration between Makeere University and the University of West Attica.



Figure 1 Snapshots for two days seminar lectures at Dept. of Civil & Environmental Eng., CEDAT



Figure 2 Visit at the Laboratory of Hydraulics, CEDAT



Figure 3 Makerere University Campus visit



Figure 4 Snapshots from day seminar lecture at the Dept. of Geology and Petroleum Engineering, CoNAS

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