CALL FOR PHD SCHOLARSHIP APPLICATION IN CHEMISTRY

I. Background

Water scarcity and contamination are among the most pressing global issues, affecting approximately 828 million people, with the majority residing in developing nations. Although water covers 70% of the Earth's surface, only 0.5% is freshwater, and much of this is inaccessible or contaminated. Contaminants in water are broadly classified as physical (e.g., suspended particles), chemical (e.g., pesticides, salts, and toxins), and microbiological (e.g., bacteria, viruses, and protozoa). Contaminated water is a leading cause of disease and mortality, particularly in rural areas where centralized water treatment systems are impractical due to their high infrastructure costs, complexity, and reliance on skilled personnel. To address these challenges, decentralized point-of-use (POU) water treatment technologies have gained prominence. Integrating artificial intelligence in the manufacturing process can optimize cost and production process of POU and chlorinated resins performance.

II. Project description and roles of PhD students

This project has been designed to systematically investigate the feasibility and effectiveness of AI and IoT-driven solutions in improving resin fabrication and POU water treatment device performance. The research is structured into distinct phases, incorporating experimental studies, real-time data collection, AI-based optimization, and performance validation.

The study will begin with a preliminary investigation to design the POU device and assess the potential of AI and IoT in optimizing the functionalization of Merrifield resin with chlorine. This phase will involve a literature review, market assessment, and feasibility analysis to ensure the technological and economic viability of the proposed solution.

The project will further employ generic programming techniques to refine resin performance assessment in a lab-scale POU water disinfection system. These AI-driven models will enable predictive analytics, helping to identify optimal operational conditions for improved microbial disinfection efficiency. The efficacy of the system will be validated through controlled experiments, measuring bacterial removal rates, chlorine retention, and long-term stability.

III. Funding

During this PhD research activities, selected candidates will be financially supported in the laboratory activities, field data collection and benefit a monthly stipend for 30 months. The project duration is 30 months.

IV. Application requirements

- Applicants should hold a master's degree in chemistry.
- Having published at least 2 articles in peer reviewed journal(s) would be an advantage.

V. Application file

The interested candidates should submit the following documents:

- A motivation letter addressed to the Director of the University of Rwanda Centre for Postgraduate Studies demonstrating commitment and reasons for applicant's interest in this programme,
- A curriculum vitae (CV),
- Notified copies of previous degrees,
- Three recommendation letters from academic senior staff members, one preferably from the Master's thesis,
- Transcripts of Master's degree.

VI. Specific eligibility criteria

- Be fluent in English, both orally and in writing
- Be a Rwandan citizen
- UR's permanent staff shall be given priority
- Male applicants should be below the age of 40 years and female below 45 of age are given priority for PhD Scholarships. In line with UR's gender policy and UR's commitment to bridge the gap in research and teaching, female candidates are encouraged to apply.

VII. Selection methodology

Shortlisted candidates will be invited to the interview on dates that will be communicated through emails.

VIII. How to apply and key dates

A copy of complete application file should be submitted by email to the University of Rwanda Centre for Postgraduate Studies Scholarship Officer at ur-cpgscholarship@ur.ac.rw Tel : 0792988304 with a copy to Assoc. Prof. Daniel Umereweneza, e-mail: d.umereweneza@ur.ac.rw.

The application files should be submitted not later than ***Friday June 26th, 2026 at 5:00 pm.***

IX. Contact for any Further Information

For any additional information, clarifications or inquiry, please do not hesitate to contact the project PI, Assoc. Prof. Daniel Umereweneza on e-mail: d.umereweneza@ur.ac.rw and Telephone number: +250785260541.

Done at Kigali on 03./.06./2026

Assoc. Prof. KAYIHURA Muganga Didas
Acting Vice Chancellor