MASTER OF SCIENCE ADVERTISEMENT (POSITION 1 – CHEMISTRY FOCUSED)

Project Title

Evaluating biofiltration for contaminant reduction using a One Health approach: a comparative assessment of polluted and biofiltered water systems for public health and water quality

Project description

The Future Water Institute at the University of Cape Town invites applications for a Master of Science (MSc) research project with a strong analytical chemistry focus, investigating contaminants of emerging concern and microplastics in freshwater systems and assessing the effectiveness of nature-based biofiltration systems.

The research focuses on two rivers in the Franschhoek region, the Stiebeuel River, impacted by informal settlement inputs, and the Franschhoek River, associated with a formal urban area. Sampling will be conducted along upstream–downstream gradients to assess spatial patterns in chemical contamination.

Biofiltration performance will be evaluated at the Water Hub research centre in Franschhoek, a decommissioned wastewater treatment facility where polluted river water and biofiltered water will be compared under realistic field conditions.

Research tasks

The Master of Science candidate will:

- Conduct field sampling of water and sediment.
- Perform laboratory analysis of contaminants of emerging concern and other relevant water-quality constituents, including sample preparation, chemical analysis, quality control, and quantification.
- Analyse relationships between chemical contamination and physico-chemical parameters
- Contribute to ecosystem and human health risk interpretation within a One Health framework

Essential

- Honours degree or equivalent in Environmental Chemistry, Chemistry, Chemical Engineering, or a related discipline
- Willingness to undertake regular fieldwork
- Ability to work independently under supervision
- Basic experience with laboratory sample preparation, water quality analysis, and data handling/interpretation
- Valid driver's licence

Highly desirable

- Background in analytical techniques (HPLC, GC/GC–MS, spectroscopic techniques)
- Demonstrated interest in pollution chemistry, microplastics, and environmental health

Training will be provided in:

- Freshwater sampling techniques
- Contaminant analysis workflows
- Microplastics analysis
- Applied statistical analysis using the R programming language
- Scientific writing and thesis preparation

The student will be embedded within a multidisciplinary research team and supported by postgraduate researchers and academic supervisors.

Funding and duration

- Duration: Two-year Master of Science programme
- Stipend: R100 000 per year

The position is embedded within a funded multi-year research project. Bursary conditions will be discussed with shortlisted candidates.

Application process

Applicants should submit the following documents:

- A motivation letter
- Curriculum vitae (max. 3 pages)
- Academic transcripts
- Contact details of two academic referees

How to Apply

Submit applications via the google form. If you experience any issues kindly send your application to Danielle Cloete (danielle.cloete@uct.ac.za) by **26 February 2026** with the subject line: "MSc Application - Position 1 – Chemistry focused"

Shortlisted candidates may be invited for an interview.

Closing date for applications: 26 February 2026

MASTER OF SCIENCE ADVERTISEMENT (POSITION 2 – BIOLOGY FOCUSED)

Project Title

Evaluating biofiltration for contaminant reduction using a One Health approach: a comparative assessment of polluted and biofiltered water systems for public health and water quality

Project description

The Future Water Institute at the University of Cape Town invites applications for an MSc research project investigating the presence of microplastics in two freshwater systems and the associated biological community shift and assessing the efficacy of nature-based water treatment in removing contaminants.

The study investigates the occurrence of contaminants of emerging concern and microplastics in two rivers in the Franschhoek region, the Stiebeuel River and the Franschhoek River, and evaluates associated changes in aquatic biological communities, particularly zooplankton.

Field sampling will be conducted along upstream–downstream gradients, and biofiltration systems will be evaluated at the Water Hub research centre in Franschhoek, a decommissioned wastewater treatment facility used to test nature-based treatment approaches.

Research tasks

The MSc candidate will:

- Assist in the collection of water, sediment, and zooplankton samples
- Quantify microplastics in water and sediment under supervision
- Identify and enumerate zooplankton to the lowest feasible taxonomic level
- Analyse relationships between contaminants, physico-chemical parameters, and zooplankton responses
- Contribute to ecosystem and human health risk interpretation within a One Health framework

Candidate Profile

Essential

- Honours degree or equivalent in Ecology, Environmental Science, Biology, Environmental Chemistry, or a related discipline
- Basic experience with freshwater field sampling and/or laboratory analysis
- Willingness to undertake regular fieldwork
- Ability to work independently under supervision
- Basic understanding of water quality parameters (e.g., temperature, pH, conductivity, nutrients)
- Valid driver’s licence

Highly desirable

- Demonstrated interest in aquatic invertebrates, pollution ecology, or environmental health

- Prior experience with freshwater field sampling (e.g., rivers, wetlands)
- Experience using microscopes
- Exposure to laboratory processing of environmental samples
- Basic data handling and analysis skills
- Willingness to work in multidisciplinary teams
- Good organisational skills for managing field and laboratory schedules

Training and development

Training will be provided in:

- Freshwater sampling techniques
- Zooplankton identification and ecological indicators
- Introduction to contaminant analysis workflows
- Applied statistical analysis using the R programming language
- Scientific writing and thesis preparation

The student will be embedded within a multidisciplinary research team and supported by postgraduate researchers and academic supervisors.

Funding and duration

- **Duration:** Two-year Master of Science programme
- **Stipend: R100 000 per year**

The position is embedded within a funded multi-year research project. Bursary conditions will be discussed with shortlisted candidates.

Application process

Applicants should submit the following documents:

- A motivation letter
- Curriculum vitae (max. 3 pages)
- Academic transcripts
- Contact details of two academic referees

How to Apply

Submit applications via the google form. If you experience any issues kindly send your application to Danielle Cloete (danielle.cloete@uct.ac.za) by **26 February 2026** with the subject line: "MSc Application - Position 2 – Biology focused"

Shortlisted candidates may be invited for an interview.

Closing date for applications: 26 February 2026