



**Kwame Nkrumah
University of Science
and Technology**

WORLD BANK AFRICAN CENTRE OF EXCELLENCE

PhD Programme

**IN WATER SUPPLY AND TREATMENT
TECHNOLOGY**



DOCTOR OF PHILOSOPHY (PHD) PROGRAMME IN WATER SUPPLY AND TREATMENT TECHNOLOGY

**RWESCK World Bank African Centre of Excellence,
Kwame Nkrumah University of Science and
Technology Kumasi-Ghana**

The PhD Water Treatment Technologies programme is hosted in the Department of Civil Engineering and run under the School of Graduate Studies of the Kwame Nkrumah University of Science and Technology. The Regional Water and Environmental Sanitation Centre Kumasi, (RWESCK) works with the Department of Civil Engineering to strengthen the research, educational and competency of sector professionals to deal with the issues of water supply and treatment technologies. The critical mass of human resources will support provision of solutions to deal with the development challenges confronting Ghana and the Sub-Saharan Africa on inadequate access to safe water supply. The programme will develop adequate human capacity in the sub-region to support the provision of water supply and treatment solutions to deal with the development challenges confronting Ghana and the Sub-Saharan Africa.

Aims and Objectives

The programme seeks to equip PhD students with knowledge, skills and competences to solve water supply and treatment problems through the development of innovative and sustainable approaches.

The objectives of this PhD programme are to equip graduates to:

- Demonstrate state-of-the-art knowledge, skills and competence in water supply and treatment technologies

- Independently formulate and execute research in accordance with academic standards leading to contribution to the body of knowledge
- Apply new concepts to solve problems of water supply and treatment technologies
- Comprehend within the myriad of challenges, the critical role of climate change and behavioural change towards achieving sustainable water resources management and by extension attainment of SDGs 6 and 13.
- Use scientific knowledge for policy formulation and implementation,
- Show evidence of scholarship by presenting a PhD thesis and publishing at least two (2) articles from PhD research in reputable peer reviewed journal.

Admission Entry Requirements

In conformity with the entry requirement of the Kwame Nkrumah University of Science and Technology, the applicants have:

- First or second Class in their first degree in Water and Sanitation, Environmental Engineering, Civil Engineering (Water Treatment and Management), Chemical Engineering, Chemistry and other relevant physical science or its equivalent.
- Good Master's degree in Water and Sanitation, Environmental Engineering, Civil Engineering (Water Treatment and Management), Chemical Engineering, and other relevant physical science disciplines, with an average of at least 60% (as shown on academic transcript).
- Students are to pass a selection interview.
- Proficiency in English: Must have first or second degree with English language as the medium of instruction, OR Must have an internationally recognised Certificate of Proficiency in English Language (TOEFL or IELTS) with above average score.

Graduation Requirements

Students shall adhere to agreed rules and regulations of the Kwame Nkrumah University of Science and Technology while following the programme. For a candidate to graduate the following requirements must be observed;

- The time required for the completion of the PhD programme shall be 4 years.
- The pass mark for examination in any course shall be 60% and the minimum Cumulative Weighted Average (CWA) for graduation shall be 60%.
- Students will be required to attend all mandatory seminars organized as part of the programme.
- The Student will submit a thesis for approval by the Department of Civil Engineering and RWESCK Management. The thesis must represent an original

contribution to knowledge in Water Supply and Treatment technologies and has to be written in English.

- The defence of the thesis is done by the School of Graduate Studies of the Kwame Nkrumah University of Science and Technology, Kumasi, before an Examination Panel Graduate Committee
- The minimum number of credit hours required for graduation is 73 credit hours.
- Students will be required to publish at least two (2) articles in a reputable international peer-reviewed journal (SCI, SCOPUS indexing etc.) from their research before qualifying for graduation.
- PhD students are encouraged to attend at least one national/international conference to present the results of their work.
- Students are required to be on internship for a minimum of six (6) weeks

Employment:

Students graduating from this programme will work as scientific officers, professionals or academicians.

They are expected to find employment in the following organisations:

- Academic and Research Institutions
- Water Supply and Treatment, Industrial water production agencies and bodies,
- Departments of water supply and management
- Private sector consultancy firms
- Local Government Authorities
- National Disaster Management Organisations
- Environmental protection agencies,
- Overseas Aid programmes
- Non-Governmental Organizations

Taught Courses and Research

The research proposal including the research plan should be completed in year one semester two. During this period students are expected to do comprehensive literature review of their chosen topic. The proposal should be prepared in close consultation with the prospective or appointed PhD Supervisors. The research proposal should be presented before a panel of academic staff for approval. The students will undertake laboratory or fieldwork based on their area of specialization. The fieldwork can be done in Ghana or in the partner institutions depending on

expertise (supervisor), availability of equipment and accessibility to relevant data.

- The final write up of the thesis is expected to be completed in the fourth year.
- Students will write their thesis in the format approved by the School of Graduate Studies of Kwame Nkrumah university of Science and Technology.
- Each student shall submit manuscripts for the publication of at least two papers in a indexed peer reviewed journal.

Table 1: Programme structure, Summary of Courses and Credits

Module	Module Name	Course Code	Course Name	T (hr)	P (hr)	Total Credit
YEAR ONE - SEMESTER ONE						
1	Public Health and Environment	WRES 743	Environmental Impact Assessment (EIA)	2	1	2
		WRES 719	Environmental and Public Health	2	1	2
		Sub-Total Credits		4	2	4
2	Applied Statistics and Modelling	WRES 727	Applied Statistics for research	2	2	3
		WREM 717	Modelling Tools	1	2	2
		WREM 719	Reliability and Risk Management	1	2	2
		Sub-Total Credits		4	6	7
3	Geo-Spatial Analysis	WRES 725	Application of GIS and Remote Sensing in Environmental Systems	1	4	3
		Sub-Total Credits		1	4	3
4	Skills Development and Research Methodology	WRES 711	Skills Development & Scientific communication	1	2	2
		WRES 713	Research Methods	2	2	3
		Sub-Total Credits		3	6	5

Mod- ule	Module Name	Course Code	Course Name	T (hr)	P (hr)	Total Credit
YEAR ONE – SEMESTER TWO						
5	PhD Thesis	WRES 890	PhD Thesis (proposal writing)			
	Elective courses		MSc Courses* MSc Courses**			
	Seminar 1		Global Water and Environmental Issues			
	Seminar 2		Sanitation and waste treatment Technologies			
	Seminar 3		Entrepreneurship and Business Development			

YEARS 2 TO 4 SEMESTERS ONE & TWO						
	PhD Thesis research	WRES 890	PhD Thesis research (lab and fieldwork, thesis writing)	0	108	54
TOTAL CREDITS				12	126	73

**Students with deficiency at the MSc level are mandated to take at least 2 relevant MSc level courses,*

***Students can also audit additional courses at MSc level as approved by the supervisor(s)/programme coordinator, to help their research.*

Student Learning Outcomes

Graduates from the PhD programme are expected to be able to:

- Demonstrate state-of-the-art knowledge, skills and competence in water supply and treatment technologies
- Independently formulate and execute research in accordance with academic standards leading to contribution to the body of knowledge
- Apply new concepts to solve problems of water supply and treatment technologies
- Use scientific knowledge for policy formulation and implementation,
- Show evidence of scholarship by presenting a PhD thesis and publishing articles in reputable peer reviewed journal.

THANK YOU