



THE TECHNICAL UNIVERSITY OF KENYA

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NAME: DR JOHN WILLIS JUMA PESA AKACH

Faculty:	ENGINEERING AND THE BUILT ENVIRONMENT
School:	CHEMICAL AND BIOLOGICAL SYSTEMS ENGINEERING
Department:	CHEMICAL AND PROCESS ENGINEERING
Current Designation:	Lecturer, CHEMICAL AND PROCESS ENGINEERING (DCPE)
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Consultation Hours:	8AM-5PM MON - FRI



EDUCATION

LEVEL	QUALIFICATION NAME	INSTITUTION	YEAR
Doctor of Philosophy (PhD)	CHEMICAL ENGINEERING	VAAL UNIVERSITY OF TECHNOLOGY(South Africa)	2022
Masters of Technology (M.Tech)	CHEMICAL ENGINEERING	VAAL UNIVERSITY OF TECHNOLOGY(South Africa)	2014
Bachelor of Technology (B.Tech)	CHEMICAL AND PROCESS ENGINEERING	MOI UNIVERSITY(Kenya)	2009
O level/Equivalent	Kenya Certificate of Secondary Education	MASENO SCHOOL(Kenya)	2002
KCPE/Equivalent	KENYA CERTIFICATE OF PRIMARY EDUCATION	KIBOS ROAD ACADEMY(Kenya)	1998

WORK EXPERIENCE

PERIOD	INSTITUTION	POSITION
2022 - Present	Technical University of Kenya	Lecturer
2018 - 2022	Technical University of Kenya	Tutorial Fellow
2014 - 2018	Vaal University of Technology	Laboratory Technician
2011 - 2014	Vaal University of Technology	Tutor
2010 - 2011	West Kenya Sugar Co. Ltd.	Management Trainee

GENERAL STATEMENT ON RESEARCH AREAS

My research interest is in the design and modelling of reactors for wastewater treatment of biorecalcitrant pollutants from petroleum, textile and distillery industries as well as pharmaceutical products. I am also interested in the production of biogas from various feedstocks in plug flow reactors.

SELECTED PUBLICATIONS

TITLE	LINK TO PUBLICATION	YEAR
Akach, J., Onyango, M.S., Ochieng, A., 2019. Adsorption and Photodegradation of Sulfamethoxazole in a Three-phase Fluidized Bed Reactor. In Emerging Energy Alternatives for Sustainable Environment, 141 - 152. CRC Press.	View online	2019
Ochieng, A., Pambi, R. L. L., Netshitangani, P., Akach, J. P., Onyango, M. S., 2012, Solar/UV photocatalytic degradation of two commercial textile dyes, Journal of Sustainable Development and Environmental Protection, 2 (1), 36 - 48.	View online	2012
Akach, J., Kabuba, J. and Ochieng, A., 2023. Simulation of Photocatalytic Reactors. Photoreactors in Advanced Oxidation Processes: The Future of Wastewater Treatment, 277 - 303. Scrivener Publishing.	View online	2023
Akach, J., Kabuba, J., Ochieng, A., 2020. Simulation of the light distribution in a solar photocatalytic bubble column reactor using the Monte Carlo method. Industrial & Engineering Chemistry Research, 59(40), 17708 - 17719.	View online	2020
Akach, J., Ochieng, A., 2018. Monte Carlo simulation of the light distribution in an annular fluidized bed photocatalytic reactor. Chemical Engineering Research and Design, 139, 248-258	View online	2018
Thulari, V.R., Akach, J., Chiririwa, H., Ochieng, A., 2016. Solar Photocatalysis of Methyl Orange Using Multi-Ion Doped TiO ₂ Catalysts. World Academy of Science, Engineering and Technology, International Journal of Chemical, Molecular, Nuclear, Materials and Metallurgical Engineering, 10(12), 1437 - 1442.	View online	2016
Akach, J., Nyembe, N., Ochieng, A., Numerical simulation of the hydrodynamics in a bubble column reactor: influence of turbulence models, 11th South African Conference on Computational and Applied Mechanics (SACAM 2018), Vanderbijlpark, South Africa, 17th - 19th September 2018.	View online	2018
Akach, J., Davhana, A., Masilela, M., Ochieng, A., Solar photodegradation of methyl orange in the presence of cations (Pb ²⁺ and Fe ²⁺) and anions (Cl ⁻ and SO ₄ ²⁻), Proceedings of the 2017 Annual Conference on Sustainable Research and Innovation, Juja, Kenya, 3rd - 5th May 2017.	View online	2017
Akach, J., Onyango, M. S., Ochieng, A., Solar Photocatalysis and Adsorption of the Antibiotic Sulfamethoxazole in Wastewater, 5th International Conference on Computer, Electrical, Electronics and Biomedical Engineering (ICCEEBE'2015), Bali, Indonesia, 16th - 17th August 2015	View online	2015
Khune, M., Akach, J., Ochieng, A., Solar photodegradation of phenol using a composite catalyst of silica and TiO ₂ , International Conference on Chemical Engineering and Advanced Computational Technologies (ICCEACT'2014), Centurion, Pretoria, South Africa, 24th - 25th November 2014.	View online	2014
Aoyi, O., Onyango, M.S., Apollo, S., Akach, J., Nyembe, N., Otieno, B., Brooms, T., 2017. Anaerobic and photocatalytic treatment of textile and distillery wastewater in integrated fluidized bed reactors. WRC Report No. 2388/1/18, Water Research Commission, Pretoria.	View online	2017
Aoyi, O., Apollo, S.O., Akach, J., Pete, K.Y., 2015. Integrated photo-catalytic and anaerobic treatment of industrial wastewater for biogas production. WRC Report No. 2105/1/14, Water Research Commission, Pretoria.	View online	2015

COURSES TAUGHT

NAME	DESCRIPTION	PERIOD
Process Measurement and Instrumentation	Static and dynamic characteristics of instruments. Sensors and transducers. Signal conversion and processing. Signal transmission and display. Maintenance of instrumentation systems.	2018 - TO-DATE
Chemical Engineering Thermodynamics I	Volumetric and thermodynamic properties of fluids. Equations of state.	2019 - TO-DATE
Chemical Engineering Thermodynamics II	Solution thermodynamics. Vapour-Liquid equilibria. Chemical Reaction equilibria.	2020 - TO-DATE
Bioenergy Technologies	Renewable energy. Biodiesel. Bioethanol. Biogas. Biomass pyrolysis.	2019 - 2019
Fluid Mechanics I	Introduction to fluids. Mass, Energy and Momentum balances and their application.	2018 - 2022
Fluid Mechanics II	Laminar and turbulent flows. Friction losses. Pipe networks. Pumps.	2018 - 2023
Process Control System Engineering I	Mathematical models. Laplace transforms. Dynamic response of first and second order systems. Feedback control. Dynamic response of feedback controlled processes.	2024 - TO-DATE

PROFESSIONAL AFFILIATIONS AND SOCIETIES

TITLE	INSTITUTION
Graduate Engineer	Engineers Board of Kenya