
FRANCIS KWAKU ATTIOGBE

Associate Professor, Department of Civil & Environmental Engineering
University of Energy & Natural Resources
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Summary

A professional with a unique combination of experience in Chemical, Environmental (Water Supply & Environmental Sanitation) & Paper Science Engineering, strong skills in GC, FTIR, and NMR analytical techniques, and a Certified Six Sigma Green Belt, to bring to the chemical, environmental, paper & forest products, and other allied industries and academia.

Education

- **Ph.D. Environmental & Resource Engineering**, State University of New York, College of Environmental Science and Forestry (SUNY-ESF), Syracuse, New York (USA). December 2011
 - **M.Sc. Water Supply and Environmental Sanitation**, Kwame Nkrumah University of Science and Technology, Kumasi (Ghana). 2003
 - **B.Sc. Chemical Engineering**, Kwame Nkrumah University of Science and Technology, Kumasi (Ghana). 1996
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Training

- **University of Energy & Natural Resources, School of Graduate Studies, Sunyani, Ghana**- Certificate of participation in a one-day workshop on thesis supervision (January 31, 2018)
 - **Ministry of Commerce of the People's Republic of China** – Certificate of Participation in the 2016 Seminar on Development and Utilization of Clean Energy and Renewable Energy for Developing Countries sponsored by the Ministry of Commerce and organized by Powerchina Zhongnan Engineering Corporation Limited, Changsha, China (September 26 – October 16, 2016).
 - **University of Energy & Natural Resources, Sunyani, Ghana** – Certificate of Participation in a training course on “Design and Installation of Stand-Alone PV Solar Systems and software programmes on RETScreen and Homer” (22 June – 3 July 2015).
 - **University of Energy & Natural Resources, Sunyani, Ghana**- Certificate of participation in a workshop on Methods of Teaching and Assessing Students (December 2 - 6, 2013).
 - **SUNY-ESF/SigmaQuest Consulting, Inc., USA** - Certificate of Training, **Six Sigma Green Belt** (April 19, 2011)
 - **UNESCO-IHE, Delft, the Netherlands** - International Short Course on Solid Waste Management & Engineering (10 July – 28 July 2006).
 - **Vrije Universiteit Brussel, Brussels, Belgium** - International Training Program in Environmental Impact Assessment and Information Communication Technology Applications (EIA-ICT), (May 27 - July 31, 2005).
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Research Areas

- Waste to Energy, Drinking Water and Wastewater Treatment, Water Quality, Bioremediation of Toxic and Hazardous Industry Chemicals, Chemical Engineering, Pulp & Paper Technology, Solid Waste Management & Engineering, Air Pollution Control, and Applied & Environmental Chemistry.
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Teaching Areas

- Water & Wastewater Treatment, Air Quality & Pollution Control, Environmental Chemistry, Engineering Chemistry, Environmental Engineering Laboratory, Solid Waste Management, Industrial & Hazardous Waste Management, Environmental Sanitation, Introduction to Environmental Engineering, and Hydrogen & Fuel Cells

Honours and Awards

- Herman L. Joachim Graduate Fellowship, SUNY-ESF, USA, 2007 - 2008 Academic Year
 - Netherlands Fellowship Programmes (NFP) Fellowship, 10 - 28 July 2006
 - VLIR-UOS Scholarship, May 27 – July 31, 2005
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Work Experience

University of Energy & Natural Resources, Department of Civil & Environmental Engineering, Sunyani – Ghana
Associate Professor/ Head of Department (August 1, 2021 – Date)

University of Energy & Natural Resources, Department of Energy & Petroleum Engineering, Sunyani – Ghana
Associate Professor/ Head of Department (August 1, 2020 – July 31, 2021)

University of Energy & Natural Resources, Department of Energy & Petroleum Engineering, Sunyani – Ghana
Senior Lecturer/ Head of Department (September 5, 2019 – July 31, 2020)

Ghana Institution of Engineering (GhiE) – Ghana

Local Organizing Committee (LOC) Member of the 2017 Engineering Week Celebration & Chair of the Subcommittee in charge of Engineering Students Design Competition Forum, Eusbett Hotel, Sunyani, Ghana
(November 25, 2016 – March 31, 2017)

University of Energy & Natural Resources, Department of Energy & Environmental Engineering, Sunyani – Ghana
Acting Dean, School of Graduate Studies (October 19, 2016 – October 31, 2016)

University of Energy & Natural Resources, Department of Energy & Environmental Engineering, Sunyani – Ghana
Senior Lecturer/ Head of Department (August 1, 2016 – August 5, 2018)

University of Energy & Natural Resources, Department of Energy & Environmental Engineering, Sunyani – Ghana
Senior Lecturer (August 1, 2015 – Date)

University of Energy & Natural Resources, Department of Energy & Environmental Engineering, Sunyani – Ghana
Lecturer (January 6, 2014 – July 31, 2015)

- Teaching, Research and Extension Service
- Member of a team that developed curriculum for MSc/Ph.D. in Environmental Engineering Management which was accredited and running.

Kumasi Polytechnic, Department of Chemical Engineering, Kumasi – Ghana
Senior Lecturer (June 4, 2012 - December 31, 2013)

Kumasi Polytechnic, Department of Chemical Engineering, Kumasi – Ghana
Lecturer (May 2, 2012 – June 3, 2012)

Barton College, Department of Science & Mathematics, Wilson- North Carolina, USA
Volunteer Research Scientist (January 31, 2012 – April 20, 2012)

Worked with a faculty in the Department of Chemistry researching the possibility of using $\text{HCO}_3^-/\text{H}_2\text{O}_2$ to oxidize or degrade chlorinated phenols. Also coached his senior students in their project/research work.

The Research Foundation of SUNY-ESF, Syracuse – New York
Research Project Assistant (August 22, 2011 – December 30, 2011)

Utah State University, Department of Biological Engineering, Logan – Utah, USA
Visiting Research Scholar (April 1, 2011 – July 31, 2011)

Researched the reaction of furfural with fractional catalytic biomass pyrolysis oils to improve the stability and utility of biomass pyrolysis oils as a replacement for petroleum crude oils.

The Research Foundation of SUNY-ESF, Syracuse – New York, USA
Research Project Assistant (January 16, 2007 – March 31, 2011)

I worked extensively on research projects on the possible use of peroxydicarbonate anions as bleach or disinfectant with a primary focus on fibre whitening in the pulp industry and also pollution load reduction of wastewater from the bleaching process.

Kumasi Polytechnic, Department of Chemical Engineering, Kumasi – Ghana
Lecturer (November 16, 2004 – January 3, 2007)

- Teaching Higher National Diploma courses in Safety & Pollution Control, Particulate Systems, Process Economics, Chemical Engineering Laboratory II & III, and Instrumentation & Measurement.
- Entrusted with organizing students' industrial visits.
- In charge of the department's examination issues, which entails coordinating the examination materials and processing the students' academic records.

Myroc Foods Processing Company, Tema - Ghana
Sanitation Officer (June 21, 2004 - December 7, 2004)

Entrusted with the company's waste management and pest control. This was achieved by the effective organization of the department's personnel and prudent and accountable use of materials which led to a general improvement of sanitation at the company.

Kumasi Polytechnic, Department of Chemical Engineering, Kumasi - Ghana
Part-time Lecturer (November 18, 2003 - November 4, 2004)

Eastern Volta Region Assistance Project, Accra - Ghana
Community Coordinator (January 15, 2003 - March 14, 2003)

- Worked in collaboration with the regional coordinator in the day-to-day management of the EVORAP regional office.

- Provides direct links with communities and water boards in their management training, support, and follow-up of their water systems operations.
- Assists the water & sanitation development boards (WSDBS), and mobilizes them for the implementation of capacity-building programmes aimed at the efficient management of the water system.
- Collation and maintenance of relevant data to provide a basis for monitoring project activities within the region.

Fruits and Flavour Limited, Asebu - Cape Coast - Ghana
Assistant Production Manager

(December 1, 1998 - October 27, 2000)

- Supervised the installation and trial production run of lime cordial and drinking water bottling plant in collaboration with the UK Technical Officer for Schweppes International, and later took full charge of the day-to-day production activities.
- Production planning/supervision
- Checking the water quality parameters.
- Training of staff
- Preparation of budget
- Programming the computer printing machine – domino – for manufacturing date, batch number, expiry date, counting the number of products, etc.

Archbishop Porter Girls' Secondary School, Takoradi – Ghana
Mathematics Teacher

(January 13, 1997 - November 30, 1998)

- Teaching, assigning homework, end-of-term examination, and grading of assignments.
- Counsel individual students on their career planning and college exploration processes.

Recent Conferences/Workshops/Seminars/Webinars Attended

1. Excellence in Peer Review: How to be an effective peer reviewer Webinar organized by Taylor & Francis Group, October 21, 2021.
2. Practical and hands-on teaching and learning online through labs with Coursera, Quanser & Siemens Webinar, September 28, 2021.
3. Simple sewage treatment processes in a low and middle-income countries-online seminar organized by IHE Delft Alumni Relations Office, July 27, 2021.
4. Public Open Access Books-Webinar organized by Taylor & Francis Group, July 27, 2021.
5. Innovating for Excellence in Engineering Education-Webinar organized by Coursera and International Society for Engineering Pedagogy (IGIP), July 15, 2021.
6. Bridging the Employability Gap for Engineering Students - Webinar with Coursera, Jun 9, 2021.
7. How to Publish Scholarly Books and Open Access organized by Taylor & Francis Group, May 19, 2021.
8. Scaling skills education with high-quality digital learning organized by Coursera for Campus, May 13, 2021.
9. Innovative Approaches to Hybrid and Virtual Classrooms organized by Coursera and Colegio de Estudios Superiores de Administración (CESA), May 5, 2021.
10. Quality Assurance in Research-Completing the research cycle: Publications and Intellectual property (copyrights and patents) organized by the Association of African Universities (AAU), August 25, 2020.
11. "Students and their research project supervisors: practical experiences" organized by AAU, August 19, 2020.
12. Pedagogical Scenario and online activities organized by AAU, July 8, 2020.
13. The essentials of a learning strategy organized by AAU, July 1, 2020.
14. Use of e-learning and digital resources in the post-COVID-19 era organized by AAU, June 24, 2020.
15. Africa Higher Education Centres of Excellence (ACE) Workshop, Sheraton Hotel, Abuja, Nigeria, February 24-28, 2020
16. EEISHEA Knowledge Sharing Conference, KNUST, Kumasi, 29-30 October 2019

17. Erasmus+ Project: Enhancing Entrepreneurship, Innovation, and Sustainability in Higher Education in Africa (EEISHEA), Sheila's Executive Hotel, Sunyani, April 30-May 3, 2019.
18. Erasmus+ Project: Enhancing Entrepreneurship, Innovation, and Sustainability in Higher Education in Africa (EEISHEA), Work Package 2: Student-Centred Learning, KTH, Sweden, March 5-8, 2019.
19. Erasmus+ Project: Enhancing Entrepreneurship, Innovation, and Sustainability in Higher Education in Africa (EEISHEA), Work Package 2: Student-Centred Learning, Aalborg University, Denmark, December 4-7, 2018.
20. Technology Developments and Assessments using Computational Fluid Dynamics organized by Department of Energy & Environmental Engineering, UENR, Sunyani, 21st -22nd June 2018.
21. Awareness on Productive Uses of Energy organized by the Energy Commission, Tyco City Hotel, Sunyani, 31st October 2017.
22. International Conference on Climate Change and Sustainable Development in Africa (ICCCSDA 2017), Eusbett Hotel International Conference Centre, Sunyani, Ghana, 25th – 28th July 2017.
23. 2nd AfriGEOSS Symposium: Delivering Earth Observation for Policy and Sustainable Societal Impact in Africa, Tyco City Hotel, Sunyani, 13th -15th June 2017.
24. Ghana's Natural Resources and Sustainable Development-The role of the Engineer was organized by the Ghana Institution of Engineers (GhiE), Eusbett Hotel International Conference Centre, Sunyani, 27th – 31st March 2017.
25. Renewable Energy and Energy Efficiency: Accelerating Energy Access and Security organized by Energy Commission, Accra International Conference Center (AICC), Accra, 9th - 11th August 2016.
26. Sustaining hydropower energy for economic growth and development in West Africa in Sunyani at Sheila's Lodge, 12th – 14th November 2015.
27. Turning waste into a resource – challenges and opportunities for Ghana organized by MESTI in collaboration with GIZ, Fiesta Royale Hotel, Accra, 17th February 2015.
28. Jake Carter, John Sloop, John K. Dogbe, **Francis K. Attiogbe**. Decomposition of 2, 4-dichlorophenol and 2, 4, 5-trichlorophenol using H₂O₂ and KMnO₄. SERMACS 2014, Nashville, Tennessee (Oct.16 – 19).
29. John Sloop, Jake Carter, John K. Dogbe, **Francis K. Attiogbe**. UV/Vis spectrophotometric study of the kinetics of the decomposition of 2, 4-dichlorophenol and 2, 4, 5-trichlorophenol using KMnO₄ as an oxidizing agent. SERMACS 2014, Nashville, Tennessee (Oct.16 – 19).
30. Methods of Teaching and Assessing Students organized by UENR, Sunyani, 2nd – 6th December 2013

Selected Refereed Publications

1. Prosper Naah Angnunavuri, **Francis Attiogbe**, Andrew Dansie, Bismark Mensah. Evaluation of plastic packaged water quality using health risk indices: A case study of sachet and bottled water in Accra, Ghana, *Science of the Total Environment* 832 (2022) 155073. <http://dx.doi.org/10.1016/j.scitotenv.2022.155073>.
2. Kodom, K., Attiogbe, F., Kuranchie, F.A., Assessment of removal efficiency of pharmaceutical products from wastewater in Sewage Treatment Plants: A case of the Sewerage Systems Ghana Limited, Accra, *HELIYON*, Volume 7, Issue 11, November 2021. <https://doi.org/10.1016/j.heliyon.2021.e08385>.
3. **Francis K. Attiogbe**, Abdul Rahim Mohammed, Quarm Kingslove. Assessing the potential health impact of selected heavy metals that pollute Lake Amponsah in Bibiani, Western North region, Ghana. *Scientific African* Volume 9, September 2020. <https://doi.org/10.1016/j.sciaf.2020.e00531>
4. Prosper Naah Angnunavuri, **Francis Attiogbe**, Andrew Dansie, Bismark Mensah. Consideration of emerging environmental contaminants in Africa: Review of occurrence, formation, fate, and toxicity of plastic particles. *Scientific African* Volume 9, September 2020. <https://doi.org/10.1016/j.sciaf.2020.e00546>.
5. Benjamin Weyori, **Francis Attiogbe**, Samuel Gyamfi. Problem-based Learning (PBL) Framework

for African Higher Education: A Case Study at UENR. 8th International Research Symposium on PBL, August 18, 2020, Aalborg, Denmark. pp137-147. <https://aauforlag.dk/shop/skriftserier/international-researchsymposium-on-pbl/default.aspx>

6. Kuranchie, F.A., **Attiogbe, F.**, Quarshie, J.T. and Ntibrey, R.A.K. (2020) 'Land scarcity as a site selection challenge for the management of municipal solid wastes in Accra, Ghana', *Int. J. Environment and Waste Management*, Vol. 26, No. 4, pp.423–437. DOI: 10.1504/IJEW.2020.110393
7. Raymond C. Francis, Antti Luukkonen, **Francis K. Attiogbe**, and Donatien P. Kamdem. Bicarbonate Anion and TAED as Activators in Peroxide Bleaching of a Mechanical Pulp. *Cellulose Chem. Technol.*, 2020, 54 (3-4), 319-326. DOI: <https://doi.org/10.35812/CelluloseChemTechnol.2020.54.33>
8. **Francis K. Attiogbe**, Nana Yaa K. Ayim, Joshua Martey. Effectiveness of black soldier fly larvae in composting mercury-contaminated organic waste. *Scientific African* 6 (2019) e00205. <https://doi.org/10.1016/j.sciaf.2019.e00205>
9. Prosper Naah Angnunavuri, Francis Atta Kuranchie, **Francis Attiogbe** and Esi Nana Nerquaye Tetteh. The potential of integrating vehicular emissions policy into Ghana's transport policy for sustainable urban mobility. *SN Applied Sciences*, 2019, 1:1201. <https://doi.org/10.1007/s42452-019-1215-8>
10. Francis Atta Kuranchie, Prosper Naah Angnunavuri, **Francis Attiogbe** and Esi Nana Nerquaye Tetteh. Occupational exposure of benzene, toluene, ethylbenzene and xylene (BTEX) to Pump Attendants in Ghana: Implications for policy guidance. *Cogent Environmental Science*, April 2019. <https://doi.org/10.1080/23311843.2019.1603418>.
11. **Francis Attiogbe**, Andrews Nkansah and Francis Atta Kuranchie. Shared household septic tank: A case study of Fiapre in the Brong Ahafo Region of Ghana. *AJEST* 2019; Vol. 13(3), pp. 126-134. DOI: 10.5897/AJEST2018.2622.
12. **Francis Attiogbe** and Andrews Nkansah. The Impact of Mining on Water Resources in Ghana: Newmont Case Study at Birim North District (New Abirem). *Energy and Environment Research*; Vol. 7, No. 2; 2017, 27-36. ISSN 1927-0569 E-ISSN 1927-0577 DOI:10.5539/er.v7n2p27.
13. Francis Atta Kuranchie, **Francis Attiogbe**, Ama Mbeaba Quarshie. A review of the impacts and management of oily sludge in the oil and gas industry. *International Journal of Research in Engineering and Technology*, 2017, Volume: 06 Issue: 07 | Jul-2017, pp. 32-37. eISSN: 2319-1163 | pISSN: 2321-7308. <https://doi.org/10.15623/ijret.2017.0607006>
14. **Francis K. Attiogbe** and Tahir Abdul-Razak. Evaluation of the physicochemical properties of Northern Ghana Sclerocarya birrea seed oil and proximate analysis of the process waste. *Afr. J. Food Sci.*, 2016, Vol. 10(4) pp. 48-53. DOI: 10.5897/AJFS2016.1425.
15. Andrews Nkansah, **Francis Attiogbe** and Engelbert Kumi. Scrap metals' role in circular economy in Ghana, using Sunyani as a case study. *Afr. J. Environ. Sci. Technol.* 2015, 9(11): 793-799. DOI: 10.5897/AJEST2015.2000.
16. Esi Awuah, Samuel Fosu Gyasi, William Nettey, **Francis Attiogbe**, Henk J. Lubberding, Huub J. Gijzen. Atmospheric air pollution associated with macrophyte and algal-based wastewater stabilization ponds in Kumasi, Ghana. *JENRM*, 2014, Vol. I, No. 2, 88-92.
17. **Francis K. Attiogbe**. Hydrogen peroxide decomposition in bicarbonate solution catalyzed by cobalt (II). *International Journal of Advanced Research* (2013), Volume 1, Issue 7, 411-415.

18. **Francis Attiogbe**. Comparison of membrane bioreactor technology and conventional activated sludge system for treating bleached kraft mill effluent. *Afr. J. Environ. Sci. Technol.* 2013, 7(5): 292-306. DOI: 10.5897/AJEST2013.1429.
19. **Francis K. Attiogbe** and Raymond C. Francis. Hydrogen peroxide decomposition in bicarbonate solution catalyzed by ferric citrate. *Can. J. Chem.* 2011, 89: 1289–1296.
20. **Francis K. Attiogbe** and Raymond C. Francis. Hydrogen peroxide decomposition in bicarbonate solution catalyzed by divalent manganese species. *Can. J. Chem.* 2011, 89: 1297–1303.
21. **Francis K. Attiogbe**, Samar K. Bose, Wei Wang, Alastair McNeillie, and Raymond C. Francis. The Peroxymonocarbonate Anions as Bleaching Agents. Part 1. Results with Lignin Model Compounds and Chemical Pulps. *BioResources* 2010, 5(4), 2208-2220.
22. **Francis K. Attiogbe**, Wei Wang, Alastair McNeillie, and Raymond C. Francis. The Peroxymonocarbonate Anions as Bleaching Agents. Part 2. Mechanical Pulp Brightening and the Effects of Metal Ions. *BioResources* 2010, 5(4), 2221-2231.
23. **Attiogbe, F. K.**; Glover-Amengor, M.; Nyadziehe, K. T. Correlating Biochemical and Chemical Oxygen Demand of Effluents – A Case Study of Selected Industries in Kumasi, Ghana. *West African Journal of Applied Ecology* 2007, 11, 110-118.

Professional Affiliation

- Ghana Institution of Engineering
 - American Institute of Chemical Engineers
 - TAPPI
 - The National Society of Black Engineers
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