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EMMANUEL GIKUNOO

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| Education | *Aug 2010 – Dec 2014* Louisiana State University, Baton Rouge, USA [PhD in Mechanical Engineering]Thesis Title: Utilisation of carbon nanofibers grown on glass microballoons (NMBs) in Point-of-Care Diagnostic devices* Investigated changing parameters in the fabrication of CNTS, their various properties, and their utilisation in medical devices. Malaria parasites were studied and a prototype rapid detection kit developed
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|  | *Sept 2002 – Dec 2004* University of Saskatchewan, Saskatoon, Canada [M.Sc. in Mechanical Engineering]Thesis Title: Effect of Fly Ash Particles on the Mechanical Properties and Microstructure of Aluminium Casting Alloy 535* Investigated the mechanical properties, microstructural evolution and the various chemical reactions that takes place in A535 aluminium alloy as a result of fly ash additions
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|  | Oct 1994 – June 1999 University of Science and Technology, Kumasi, Ghana [B.Sc. in Metallurgical Engineering)] |
|  | *Sept 1986 – June 1993* St. Augustine’s College, Cape Coast, Ghana *[O’ and A’ Levels]* |
| Work Experience | *April 2006 to Date* Kwame Nkrumah University of Science and Technology, Kumasi, GhanaSenior Lecturer *August 2016 to Date*Lecturer *April 2006 to July 2016** Teaching of undergraduate courses in Materials and Metallurgical Engineering; chemistry for materials and metallurgical engineers, phase transformations, mineral processing, physical metallurgy of ferrous and non-ferrous alloys, plant design, composite materials, and material quality control, assurance and selection.
* Teaching of postgraduate courses in Environmental Resources Management; environmental impact of mining and environmental laws and impact assessment.
* Researching on fabrication, microstructural studies, property enhancement and simulation of materials and metallurgical processes.
* Completed an induction and training program for Senior Members at the Kwame Nkrumah University of Science and Technology, Ghana.
* Academic tutor to some Materials and Metallurgical Engineering students
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|  | *Sept. 2020 to Date Unity Hall, KNUST, Kumasi***Hall Master*** Exercising a general superintendence over the affairs of tUnity Hall
* Enacting residuary provision for the good governance and
* Responsible for maintaining discipline in the Hall
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|  | *August 2019 to July 2020 Materials Engineering, KNUST, Kumasi***Head of Department*** Providing leadership to the Department
* Organise the teaching programmes
* Responsible (in consultation with the Department Board) for recommending to the Faculty and College Boards, the development of syllabuses and courses as well as promotion of research in the Department.
* Organise teaching programme to maintain acceptable standard of teaching, and
* Responsible for Departmental administration
 |
|  | *Sept. 2017 to July 2019 Unity Hall, KNUST, Kumasi***Hall Master*** Exercising a general superintendence over the affairs of the Hall
* Enacting residuary provision for the good governance and
* Responsible for maintaining discipline in the Hall
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|  | *Aug. 2016 – Aug. 2017 Unity Hall, KNUST, Kumasi***Senior Tutor*** Worked under the Hall Master towards the good governance of the Hall in accordance with the Hall’s constitution
* Deputized for the Hall Master in his absence
* Liaison Officer between the Junior Common Room Committee and the Hall Management/Council.
* Performed all other duties prescribed by the Hall Master and Hall Council.
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|  | *Aug 2010 to Dec 2014* Louisiana State University, Baton Rouge, CanadaResearch/Teaching Assistant* Instructed various materials engineering laboratory courses
* Manager of the materials characterisation laboratory.
* Carried out detailed literature review on CNTs and their use in point-of-care diagnostic devices.
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|  | *Sept 2002 to Dec 2004* University of Saskatchewan, Saskatoon, CanadaResearch/Teaching Assistant* Conducted tensile tests of metal alloys using the Instron and MTS machines
* Characterised the microstructures of metal matrix composites using various analytical and quantitative techniques (e.g. scanning electron microscopy (SEM), electron probe microanalysis (EPMA), hardness measurements and optical microscopy)
* Conducted heat treatment of metallic alloys and metal matrix composites (MMCs), and carried out hardenability tests of different alloy steels
* Carried out detailed literature review of corrosion and fatigue of aluminium alloys and aluminium-based MMCs
* Successfully completed a training program for new professors, graduate teachers and laboratory demonstrators at the University of Saskatchewan, Canada
* Taught and demonstrated different undergraduate materials science laboratory courses and graded assignments
 |
|  | *Aug 1999 to Aug 2001* Institute of Mining and Mineral Engineering, Kwame Nkrumah University of Science and Technology, Kumasi, GhanaResearch/Teaching Assistant* Investigated the cause of excessive cyanide consumption by the oxide gold ore at Sankofa Gold Mine, Ghana
* Carried out extensive study on the nature of the mixed oxide and sulphide ore mined at Bogosu Gold Mine, Ghana
* Organized tutorials, taught and demonstrated different undergraduate laboratory courses and graded assignments for students
* Was in charge of the Institute’s computer pool

Assessed and graded examination results |
|  | *July 1998 – Sept 1998* Abosso Goldfields Limited, Dahmang, GhanaTrainee Engineer (Internship)* Given training on gold plant operations
* Performed tests on mined samples and treated materials
* Carried out tests on leached gold solutions
 |
|  | *July 1997 – Sept 1997* Ghana Manganese Company, Nsuta, GhanaTrainee Engineer (Internship)* Given training on metallurgical duties on the plant
* Performed tests on mined samples and treated materials
* Carried out pilot project on nodulisation of different types of manganese ores
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|  | *Nov 1993 – Sept 1994* Wulugu Secondary School, Wulugu, GhanaTeacher* Mathematics and Science Teacher
* Physics laboratory Tutor
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| Service to the Academic Community | * Reviewer, Cogent Environmental Science, (October 2016 – To Date)
* Postgraduate Coordinator, Department of Materials Engineering, KNUST, Kumasi, (August 2016 – May 2021)
* Head of Laboratory, Department of Materials Engineering, KNUST, Kumasi, (February 2015 – July 2018)
* Secretary to the Committee that reviewed the ‘Articulation agreement for joint doctoral degree programme between North Carolina Agricultural and Technical State University and KNUST’ (2015)
* Field Trip Coordinator, Department of Materials Engineering, KNUST, Kumasi, Ghana (August 2014 – July 2018)
* Vacation Training/Field Trip Coordinator, Department of Materials Engineering, KNUST, Kumasi, Ghana (August 2006 – July 2010)
* External Examiner (M.Sc Thesis), Department of Materials Science and Engineering, University of Ghana, Legon
* Internal Examiner (M.Sc and PhD Thesis), Department of Materials Engineering, Kwame Nkrumah University of Technology, Kumasi, Ghana
* Reviewer, Journal of Materials Science and other high impact journals
* Faculty Examination Officer, Faculty of Chemical and Materials Engineering, KNUST, Kumasi, Ghana (July, 2007 – July 2010)
 |
| Honours/Awards | * Aug 2010 to Dec 2014 Research/Teaching Assistantship, Mechanical Engineering Department, Louisiana State University, Baton Rouge, USA.
* Aug 2010 to Dec 2014 Louisiana State University Graduate School Enhancement Award.
* *Sept 2002 to Dec 2004* Graduate Student Scholarship, University of Saskatchewan, Saskatoon, Canada
* *Oct 1994 – June 1999* Ghana Government University Scholarship
* *Sept 1986 – June 1993* Ghana Government College Scholarship
* *Sept 1986 – June 1991* Barclays Bank Ward College Scholarship
 |
| Affiliations | * Member, Ghana Institute of Engineers (MGhIE)
* Member of Canadian Institute of Mining, Metallurgy and Petroleum (CIM)
* Member of American Society of Mechanical Engineers (ASME)
* Member of National Association of Corrosion Engineers (NACE International)
 |
| Selected Research Contributions | Conference Presentations* Y. H. Gbologah, E. Gikunoo, and F. W. Y. Momade, “Sustainable Development Goals: An Opportunity to Scientific Support, *8th International Conference of the African Materials Research Society (AMRS), Accra – Ghana, 7 – 10th December, 2015*
* E. Gikunoo, E. Zegeye, A. Ghamsari, A. Abera, and E. Woldesenbet, “Use of Multiscale Multimaterial System for Improve Biodetection of Malaria,” (To be presented at the 7th International Conference of the Africa Materials Research Society, Addis Ababa, Ethiopia, December 8-13, 2013).
* E. Gikunoo, E. Zegeye, A. Ghamsari, A. Abera, and E. Woldesenbet, “Signal Amplification of Point-of-Care Immunoassay Sensors through the Incorporation of Carbon Nanofibers Grown on Glass Microballoons,” (To be presented at the1st Annual International Conference of Emerging Industry, Shenzhen, China, November 6-7, 2013).
* E. Gikunoo and E. Woldesenbet, “Utilization of Carbon Nanofibers Grown on Glass Microballoons (NMBs) in Point-of-Care Diagnostic Devices”, Annual Mechanical and Industrial Engineering Graduate Students’ Conference, Louisiana State University, Baton Rouge, April 27, 2013.
* E. Gikunoo and E. Woldesenbet, “Chemical Oxidation of Carbon Nanofibers (CNFs) Grown on Glass Microballoons (MB) for Biosensing Applications”, NextGenC3 Regional Science and Engineering Conference, April 4-5, 2012, Southern University and A&M College, Baton Rouge, USA, p. 4.
* E. Gikunoo and I. N. A. Oguocha, “Mechanical Properties and Microstructure of Fly Ash-Reinforced Aluminium MMCs”, 16th Canadian Materials Science Conference, June 5–8, 2004, Carleton University, Ottawa, Canada, p. 38.
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|  | Conference Proceeding* W. A. Uju, I. N. A. Oguocha, and E. Gikunoo, “Study of Reactivity in Particulate Al-Mg Alloy Composites Using XANES and XRD”, Proceedings of the American Society for Composites: Twenty-Fourth Technical Conference, Newark, DE, September 15–17, 2009. American Society for Composites, CD-ROM – 11 pp.
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|  | Journal Papers* D. E. P. Klenam, M. O. Bodunrin, S. Akromah, E. Gikunoo, A. Andrews, and F. McBagonluri. "Ferrous Materials Degradation: Characterisation of Rust by Colour – An Overview." Corrosion Reviews, (2021).
* K. Mensah-Darkwa, F. O. Agyemang, S. Akromah, E. K. Arthur, F. Abdallah, and E. Gikunoo, “A Comparative Study on the Performance of Activated Carbon Electrodes and Activated Carbon/Titanium Dioxide Nanotubes Hybrid Electrodes”, Scientific Africa, (2021): e00786.
* R. N. Tabi, F. O. Agyemang, K. Mensah-Darkwa, E. K. Arthur, E. Gikunoo and F. W. Y. Momade, “Zeolite Synthesis and its Application in Water Defluorination”, Materials Chemistry and Physics, (2021), 261, 124229
* D. B. Siaw, S. S. R. Gidigasu, E. Gikunoo and G. Foli, Geochemical Assessment of Trace Metals in Soil, Stream Water and Selected Food Crops at Kibi Goldfields Environment, Ghana, (2020), Earth Sciences Malaysia, 4(1), 71 – 76.
* P. Opoku, E. Gikunoo, E. K. Arthur and G. Foli, Removal of Selected Heavy Metals and Metalloids from an Artisanal Gold Mining Site in Ghana Using Indigenous Plant Species, (2020), Cogent Environmental Science, 6(1), 1840863.
* E. K. Arthur and E. Gikunoo, “Property Analysis of Thermal Insulation Materials made from Ghanaian Anthill Clay Deposits”, Cogent Engineering, (2020), 7(1), 1827493.
* E. K. Arthur, E. Gikunoo, S. Akromah, S. T. Azeko and P. Dzikunu, Alternative Materials for Grey Cast Iron Corn-Mill Plates by Computer-Aided Selection and Weighted Property Methods, SN Applied Sciences, 2020, 2(8): 1 – 9.
* E. K. Arthur, E. Gikunoo, F. O. Agyemang, S. T. Azeko, A. Andrews, and A. Twenewaa, “Material Selection for Water Pipes by the Multi-Objective Decision-Making Method: The Case of Alternative Materials for PVC Pipes”, Journal of Science and Technology, (2020), 5(1), 29 – 42.
* E. Gikunoo, A. Abera, and E. Woldesenbet, “A Novel Carbon Nanofiber Grown on Glass Microballoons Immunosensor: A Tool for Early Diagnosis of Malaria”, Sensors, 2014, 14(8), 14686 – 14696.
* E. Gikunoo, A. Abera, and E. Woldesenbet, “Achieving Ultra-Low Detection Limit using Nanofiber Labels for Rapid Disease Detection,” Advances in Infectious Diseases, 2014, 4(4), 214 – 222.
* A. Andrews, E. Gikunoo, L. Ofosu-Mensah, H. Tofah and S. Bansah, “Chemical and Mineralogical Characterization of Ghanaian Foundry Slags”, Journal of Minerals & Materials Characterization & Engineering, 2012, 11(2), 183 – 192.
* A. Andrews, E. Gikunoo, B. K. Kyei-Fram and R. Sarfo, “Characterization of Spent Prebaked Aluminium Carbon Anode as a Source of Fuel for Foundrymen”, Journal of Minerals & Materials Characterization & Engineering, 2012, 11(1), 31 – 41.
* W. A. Uju, E. Gikunoo and I. N. A. Oguocha, “XRD and XANES study of reactions in particulate Al-Mg Alloy Composites”, Canadian Metallurgical Quarterly, 2011, 50(1), 54-60.
* E. Gikunoo and I. N. A. Oguocha, “Effect of Fly Ash Addition on the Magnesium Content of Casting Aluminium Alloy A535”, Journal of Materials Science, 2005, 40(2), 487-490.
* E. Gikunoo, O. Omotoso and I. N. A. Oguocha, “Effect of Fly Ash Particles on the Mechanical Properties of Aluminium Casting Alloy A535”, Materials Science and Technology, 2005, 21(2), 143 – 152.
* E. Gikunoo and I. N. A. Oguocha, “Effect of Fly Ash Addition on the Magnesium Content of Casting Aluminium Alloy A535”, Journal of Materials Science, 2004, 39(21), 6619 – 6622.
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| References | To be supplied upon request |