Desmond Edem Primus **Klenam**

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|| PhD (Wits), MSc (Wits), PGDip (HE)(Wits), BSc (KNUST) || NRF Y rated Scientist ||

Desmond Klenam (PhD) is a Senior Lecturer (Assistant Professor) in Physical Metallurgy and Materials Science at the University of the Witwatersrand (Wits) in Johannesburg, South Africa, where he co-directs the Next Frontiers in Advanced Materials Laboratory (NFAML). He is a Research Fellow and Visiting Scientist at the Soboyejo Research Laboratory and a Co-Principal Investigator of the Global Centre for Advanced Materials and Manufacturing (GCAMM) at SUNY Polytechnic Institute, where his work has applied machine learning to develop databases for dilute and complex concentrated alloy design.

He has held visiting appointments at Worcester Polytechnic Institute, serves as a Principal Investigator at Academic City University in Ghana, and was the 2022/2023 African Oxford Fellow at the University of Oxford. His prior professional experience includes consulting with Hatch Advisory across Africa, Europe, and the Middle East, earning the 2021 Global Operational Excellence Award.

Klenam is also a co-convenor of the Young African Scientists initiative under the African Renaissance Institute for Science and Technology (ARIST), a global organisation that works with academic institutions, African governments, and the private sector to advance scientific capacity and innovation on the continent. Through its online platform, The Engine, the initiative offers free virtual AI and machine learning courses for research and industry applications. As a steering committee member of ARIST, Klenam supports its mission to empower emerging African researchers through mentorship and collaboration. Since its launch in 2025, the programme has engaged more than 350 learners from over 15 African countries, expanding access to technical training and capacity-building across the continent.

A registered professional engineer with Engineers Australia, he holds a PhD and MSc from Wits and a BSc (Hons) from Kwame Nkrumah University of Science and Technology. He "blends the curiosity of a novice with the precision of an expert," and his research advances sustainable, circular alloy solutions using integrated computational and experimental methods. Known for mentoring young professionals, he aims to "aspire to inspire before I expire." Beyond academia, he enjoys table tennis, football, and the gym.

Educational Background & Qualification

2024	**Postgraduate Diploma in Higher Education,** Wits School of Education, Wits University, Johannesburg, South Africa
2019	**Doctor of Philosophy (Ph.D),** Metallurgy & Materials Engineering. **Thesis title –** Composition refinement of medium carbon low alloy steels to improve wear and corrosion resistance for rail axle applications. **Supervisors –** L.A. Cornish (PhD) & L.H. Chown (PhD), Wits University
2013	**Master of Science (MSc(Eng)),** Metallurgy & Materials Engineering. **Dissertation title –** Effect of temperature and carbonaceous environment on the fatigue behaviour of AISI 316L austenitic stainless steels. **Supervisors –** L.A. Cornish (PhD) & L.H. Chown (PhD), Wits University
2009	**Bachelor of Science (BSc(Hons)),** Materials Engineering, Kwame Nkrumah University of Science and Technology (KNUST), Ghana.

Career Objectives

Research	Conduct world class, internationally competitive and locally relevant multidisciplinary research in Materials Science and Engineering to address the socio-economic challenges in education, health, energy, and transportation. This will be achieved by developing low-cost structural and functional materials by exploring low-cost manufacturing methods and then using state-of-the-art characterization techniques to understand mechanisms at a fundamental level. Research throughputs are in the form of intellectual property, defining publications in quartile one to three (Q1 - Q3) peer-reviewed international journals and presenting at leading international and local conferences.
Training	Apply project-based approach to train the next generation of Materials Scientists and Engineers. This is being done in collaboration with industrial partners, regional bodies and academia. The incentive is to mentor the next generation of materials engineering students to become experts and exponential thinkers with well-formed minds at the expense of well-filled minds.
Civic duty	Promote girl child education in areas of Science, Technology, Engineering, Arts and Mathematics (STEAM) to reflect the global demographics. This is to create an enabling environment for women to challenge the status quo and flourish.

Scholarships and awards

2023 – **African Research Universities Alliance (ARUA) Centre of Excellence in Materials, Energy and Nanotechnology Travel Grant 2023**, Material Science International Team Winter School & Phase Diagram Evaluation Meeting, Castle Ringsberg, Tergensee, Germany

2021 - 2023 – **Staff Bursary, Postgraduate Diploma in Higher Education**, University of the Witwatersrand, Johannesburg, South Africa

2021 – **Operational Excellence Award**, Business Improvement Category, Hatch Advisory Business Unit (Africa, Europe & Middle East), Hatch Global Excellence Award, Missisuaga, Canada

2013 – 2018 – **PhD Scholarship**, DST-NRF Centre of Excellence in Strong Materials, Wits University

2013 – 2018 – **PhD Scholarship**, DST-AMI Postgraduate Bursary, Mintek, South Africa.

2017 – **Runner Up Prize, Best Oral Presentation**, DST-AMI Precious Metals Development Conference, Polokwane, South Africa

2014 – 2016 – **Postgraduate Merit Award toward PhD studies.**, Financial Aid and Scholarship Office, Wits University.

2015 – **Fellow**, Massachusetts Institute of Technology (MIT) Global Startup Labs, First Runner Up Prize & Team Lead, SkyClass Project - digitised interactive platform for Mathematics and Entrepreneurship Studies

2013 – **African Union Category Award**, Sixth Science Conclave with eight Nobel Laureates, 200 Turing Awardees and 1500 Eminent and Emerging scientists at Indian Institute of Information Technology (IIIT), Allahabad, India.

2012 – **Postgraduate Merit Award towards MSc study**, Financial Aid and Scholarship Office, Wits University

2012 – **Corrosion Engineering Short course Award**, Corrosion Institute of Southern Africa, Johannesburg, South Africa

2011 – 2012 – **MSc Scholarship**, DST-NRF Centre of Excellence in Strong Materials, Wits University

Honours and fellowships

2024 – **Principal Investigator & Co-Lead**, Next Frontiers in Advanced Materials Laboratory, School of Chemical and Metallurgical Engineering, Wits University

2024 – **Co Founding Member**, The Young African Scientist, Secretariat - SUNY Polytechnic Institute, Utica, New York, USA

2024 – **Steering Committee Member**, African Renaissance Institute of Science and Technology (ARIST), SUNY Polytechnic Institute, Utica, New York, USA

2024/2025 – **Fellow**, The Horizon Institute, The Global Academy Crucible Program, Leeds University, United Kingdom

2023 – **Member**, Development and implementation of Problem-based approaches in Materials and Manufacturing, and virtual training of trainers (TOT) for the piloting of learning management system for 23 universities under the Nigerian University Commission

2023 – **Member and Subject Matter Expert, Ten Member Committee**, Development of Materials Science and Engineering Program, Curriculum Advise and thematic research areas for the University of Liberia

2023 – **Training of Trainers (TOT) for PhD Student Supervision and Retention in Sub-Saharan Africa**, Consortium for Advanced Training of Research in Africa (CARTA) Joint Advanced Seminars (Five day Workshop), University of Rwanda, Kigali, Rwanda

2023 - 2024 – **Fellow**, The Africa Oxford (AfOx), Oxford Micromechanics Group, Department of Materials, The Africa Oxford Initiative, University of Oxford, United Kingdom

2023 - 2024 – **Fellow**, St. Edmund ("Teddy") Hall, University of Oxford, United Kingdom

2020 –2023 – **Fellow & Visiting Scientist**, Soboyejo Research Group, Department of Mechanical and Materials Engineering, Worcester Polytechnic Institute, USA

2020 – – **Fellow & Visiting Scientist**, Rahbar's Group for Bioinspired Materials Design Lab, Department of Civil and Architectural Engineering. Worcester Polytechnic Institute, USA

2015 – **Fellow & Class of 2015**, Top 100 promising young minds in Africa, Brightest Young Minds Fellowship Barclay Africa, Johannesburg, South Africa

2015 – **Massachusetts Institute of Technology (MIT) Global Startup Labs**, First Runner Up Prize & Team Lead, SkyClass Project - digitised interactive platform for Mathematics and Entrepreneurship Studies.

2013 – **Sixth Science Conclave, African Union Category.** Conversation with eight Nobel Laureate, 200 Turing Awardees and 1500 Eminent and Emerging scientists at Indian Institute of Information Technology (IIIT), Allahabad, India

2011 – **Pan African School of Materials (PASMAT) Summer School**, Science Initiative Group (SIG), Princeton University and the African University of Science and Technology, Abuja, Nigeria

2008 – **German Academic Exchange Services (DAAD) - International Association of Exchange of Students for Technical Experience Internship Fellowship**, Laboratory of Materials Characterization and Metallurgy, University of Applied Sciences, Osnabrueck, Germany

Research Interests

Physical Metallurgy	Computational & Experimental Alloy development, Mechanical behaviour of Materials, Fracture, Failure and Metallic Corrosion Investigations, Cold Spraying & Additive Manufacturing
Areas of Materials Research	Complex Concentrated Alloys (High Entropy Alloys), Titanium Alloys, Aluminium alloys, HIgh temperature Materials & Steels
Novelty and Unique Approach	Development of Materials using dirty (scrap) metals to address circular economy, recycling and innovation for all. Emphasis is on the development of material systems using low-cost manufacturing methods while focusing on the mechanisms that drives the structural and functional properties.

Research Funding & Grants

Grants awarded – PI - Principal Investigator, Co-PI - Co Principal Investigator

[2026 - 2030] – **Co-PI** – Building Capacity in Circular Natural Building Materials using Frugal Digital and Traditional Engineering Innovation (BUCABUMA), Intra-Africa Academic Mobility Scheme, Neighbourhood, Development and International Cooperation Instrument (NDICI - MOBAFUN), European Education And Culture Exchange Agency, European Union Mobility Grant Agreement (EUR €1,430,820).

[2025 - 2029] – **PI** – National Research Funding Y Rating Funding (RA231031159798), (ZAR 50,000) (US$3100).

[2026 - 2028] – **PI** – National Research Funding Thuthuka Rating Track Grant (TTK250318304827) for three years rated, (ZAR 900,000) (US$56000).

[2025 - 2030] – **PI** – National Research Foundation "Y" rated University Support Funding, Research Office, University of the Witwatersrand, (ZAR 100,000) (US$ 6200).

[Jan - Dec 2026] – Co-PI – Crucible Funding, Horizon Institute, University of Leeds, Development of Sustainable Spark Plasma Sintered Implants for Patients with Chronic Cardiovascular Disease, (UK£8,000)

[2025 - 2027] – **PI** – Funding for three MSc Students from the Physical Metallurgy Group, Mintek, Department of Mineral Resource (US$48,000)

[2025 - 2027] – **PI** – Funding from the National Foundry Technology Network (NFTN) to revamp indigenous South African foundries (US$55,000).

[2024 - 2026] – **Co-PI** – Seed Grant for the Establishment of the Global Centre for Advanced Materials and Manufacturing, State University of New York (SUNY) Polytechnic Institute, (US$280,000).

[2024 - 2026] – **Co-PI** – Titanium alloys and nanostructures for next generation biomedical devices, State University of New York (SUNY) Polytechnic Institute Seed Grant, (US$52,000).

[2024 - 2026] – **Co-PI** – Investigating the irradiation stability of indigenous carbonitriding agents (Co - applicants : Ericmoore Jossou, Nuclear Science and Engineering (MIT) & Tabiri Asumadu, PhD (Sunyani Technical University, Ghana)), MIT - Africa Seed Fund (US$22,000).

[2023] – **PI** – Top Slice, Faculty of Engineering and the Built Environment Early Career Funding, Wits University, (ZAR50,000 (US$2,500). Two papers were published.

[2022] – **Co-PI** – Top Slice, Faculty of Engineering and the Built Environment Early Career Funding, Wits University, (ZAR40,000 (US$2,000). Two papers were published on low-density steels.

[2023] – **Visiting Scientist** – Worcester Polytechnic Global Fellowship Award, **Understanding Macroscale superlubricity and strain gradient plasticity phenomenon of carbon-coated metallic alloys**, (US$10,000.00).

[2021] – **Visiting Scientist** – Worcester Polytechnic Global Fellowship Award, **Low-cost complex concentrated alloy design for structural and functional applications**, (US$ 5,000.00)

Patents

2025 – T.K. Asumadu, M. Vandadi, K. Mensah - Darkwa, E. Gikunoo, S. Kwofie, **D.E.P. Klenam**, N. Rahbar & W.O. Soboyejo - Graphene Deposition Coatings (United States Patent 2025/0122444A1 / WO 2024216039A1)

Work Experience I : Teaching Experience

August 2025 –

Associate Professor (Sustainable Metallurgy & Materials Science), School of Chemical & Metallurgy Engineering, Wits University

- Teach undergraduate and postgraduate courses in sustainable metallurgy, materials science and crystallography
- Design, administer and assess coursework, practical activities, tests and examinations
- Advise and mentor MSc and PhD students across Metallurgy and Materials Engineering research areas
- Contribute to curriculum development, academic administration and School-level academic and extracurricular activities

Teaching & Learning | Postgraduate Mentorship | Curriculum Development | Academic Assessment | Academic Leadership

August 2025 –

Senior Lecturer, School of Chemical & Metallurgy Engineering, Wits University

- Taught undergraduate and postgraduate courses in materials science, crystallography, failure analysis and corrosion/electrometallurgy.
- Designed, administered and assessed coursework, practical activities, tests and examinations.
- Advised MSc and PhD students across Metallurgy and Materials Engineering research areas.
- Contributed to curriculum development, academic administration and School-level academic and extracurricular activities.

Teaching & Learning | Postgraduate Mentorship | Curriculum Development | Academic Assessment | Academic Leadership

May 2024 – Sep 2025

Lecturer, School of Chemical & Metallurgy Engineering, Wits University

- Taught undergraduate courses in Materials Science and Engineering and Crystallography.
- Developed and delivered lectures, learning materials and blended-learning activities.
- Designed and assessed student tests, assignments and examinations.
- Advised postgraduate students and contributed to School academic and administrative activities.

Teaching & Learning | Student Assessment | Postgraduate Advising | Curriculum Development | Academic Leadership

Feb 2022 – Apr 2024

Sessional Lecturer, MSc Corrosion, School of Chem. and Metal. Engineering, Wits University

- Delivered postgraduate teaching on corrosion in oil and gas environments.
- Designed and facilitated laboratory and experimental corrosion sessions.
- Developed and assessed coursework, tests and examinations.
- Provided academic guidance and mentorship to postgraduate students

Teaching & Learning | Project-based & Experiential Learning | Student Assessment | Academic Mentorship

Feb 2019 – Dec 2019

Coordinator, Teaching Assistants & Tutors, ADU, Faculty of Engineering, Wits University

- Recruited, trained and coordinated 12 teaching assistants and more than 35 undergraduate tutors.
- Coordinated tutorial support and academic interventions for the Common First Year Programme.
- Managed and quality-assured the assessment of more than 850 examination scripts.
- Provided academic and psychosocial support to students and facilitated access to appropriate university support structures.

Academic Coordination | Teaching Development | Student Support | Teaching Assistants Development | Staff Supervision

Jul 2018 – Dec 2018

Assistant Course Coordinator and Academic Advisor, ADU, Faculty of Engineering, Wits University

- Coordinated Engineering Mathematics tutorials supporting approximately 1,400 undergraduates.
- Managed and allocated teaching responsibilities to a team of postgraduate tutors.
- Advised academically at-risk students and supported cases at Faculty readmission structures.
- Contributed to the ADU Summer School byteaching in mathematical thinking and professional skills.

Teaching Coordination | Student Success | Academic Advisory | Tutor Management | Mentorship & Academic Development

Jul 2017 – Dec 2017

Sessional Lecturer, Applied Maths for Architecture I, Part Time Studies Centre, Wits, Johannesburg

- Delivered Applied Mathematics lectures to undergraduate Architecture students.
- Assessed student learning and served as co-examiner for end-of-semester examinations.
- Supported academic quality assurance and alignment with the corresponding mainstream course

Applied Maths Education | Student Assessment | Academic Support | Monitoring Monitoring & Evaluation | Ditigal Learning

Aug 2009 – Oct 2010

Research and Teaching Assistant, Department of Materials Engineering, KNUST, Kumasi

- Supported teaching of courses (Materials Science Principles and Mechanical Mehaviour of Materials).
- Supported experimental research for four undergraduate capstone projects.
- Facilitated tutorials and practical learning activities for undergraduate engineering students
- Assisted with examination administration and logistics within the College of Engineering

Engineering Education | Academic & Research Support | Experiential Learning | Student Development | Student Assessment

Work Experience II : Specialized & Applied Sciences Research

Feb 2023 - Feb 2024

Africa Oxford Visiting Fellow, Oxford Micromechanics Group, Department of Materials, University of Oxford, Oxford United Kingdom

- Conducted cutting-edge experimental research on the design of bulk complex concentrated alloys for advanced structural and functional applications using advanced characterization techniques
- Wrote and published papers in high impact journals.
- Developed and fostered continuous collaboration and long - term partnership with the Oxford Micromechanics Group at the Department of Materials, University of Oxford.

Complex concentrated alloys | Alloy Development | Micromechanisms | High resolution transmission electron microscopy

Jun 2020 - Dec 2023 –

Visiting Research Scholar, Soboyejo Research Group, Department of Mechanical Engineering, Worcester Polytechnic Institute (WPI), Worcester, Massachusetts, USA

- Conduct cutting-edge theoretical and experimental research on the design of bulk and coating-based complex concentrated alloys
- Spend at least three to six months every year (April - July) at Soboyejo Research Lab to conduct cutting-edge experiments
- Write papers for journal publications, conference proceedings and book chapters (over 10 book chapters and more than seven journal papers have been published)
- Provides guidance, support and mentorship to PhD students and Postdoctoral Fellows

Complex concentrated alloys | Alloy Development | Cold spray technologies | Finite Element Modelling

Jan 2018 – Dec 2018

Research Fellow, Physical Metallurgy Group, Advanced Materials Division, Mintek, Randburg

- Conducted first principle alloy development using CASTEP based on Density Functional Theory
- Contributed to conference publications and poster presentations
- Reviewed internal research reports on on-going projects with the physical metallurgy group
- Carried out material testing and characterization and presented reports to clients
- Conducted extensive literature reviews on various manufacturing techniques and mechanical behaviour of different engineering materials

Quantum Mechanics | Density Functional Theory | Alloy Development | CASTEP Code

Dec 2017 – Nov 2018

Acting Technical Director, Mechanical Characterization Laboratory, Vertiney Investment, Pretoria

- Approved final reviews, laboratory results, protocols, reports and standard operating procedures
- Ensured adequate availability of consumables and facilities to meet departmental needs
- Implemented policies and procedures to maintain compliance to standards and quality systems
- Created standardised reporting systems and templates to communicate results to customers
- Participated and maintained cross-functional teams and relationship within the organisation
- Ensured constant vigilance in the laboratory for non-conforming events, developed a culture of transparency and rapid evaluation of projects for clients
- Enforced general housekeeping in and around the laboratory and ensured test equipment are well calibrated

Corrosion tests | Consultancy | Mechanical behaviour of Metals | Failure investigations

Jun 2008 Sept 2008

Research Intern, Hochschule Osnabruck, University of Applied Sciences, Osnabruck, Germany

- Used advanced characterisation tools to study properties and microstructures of biomedical implants made from various ferrous and non-ferrous materials
- Part of a four member team that carried out root cause analysis of some failed steam turbine blades for one of the collaborating industrial partners. Was responsive for taking the fractured surface and studying them with advanced microscopes.
- Conducted mechanical tests (low/high cycle fatigue, hardness and tensile) on various ferrous-based structural metals.

Mechanical Metallurgy | Low/high cycle fatigue | High resolution SEM | Metallographic preparation | Phase analyses

Work Experience III : Academic Advisory and Management Consulting

May - Dec 2020

Mar 2021– Apr 2024

Postgraduate Student Coordinator, Academic Development Unit (ADU), Faculty of Engineering & Built Environment, Wits University

- Develop faculty-wide intervention programs to improve academic, research, eco- and psycho-social well-being of postgraduates
- Organise and run academic (proposal, articles, presentations, dissertation and thesis writing) and non-academic postgraduate student development workshops
- Set up student support structures with the different schools in the faculty
- Develop individualised research-related support and remote access training to relevant university research resources for postgraduate students.

Postgraduate Research | Academic Advisory | Psycho-social support

May 2019

Consulting Advisory Analyst, Hatch Advisory, Africa, Europe and Middle East Region, Hatch Africa (Pty) Limited, Greenstone, Johannesburg

- Coached and trained middle level management on data-driven decision support.
- Built and implemented project management tools such as activity trackers, value driver trees and dashboards for performance monitoring.
- Conducted brown-paper sessions, assessed the management operating system and built cost throughput models for mining and energy companies.

Business Improvement & Advisory | Management Consulting | Data Analytics & Excel Programming

Current and Active Research Projects

Funding Agency - State University of New York (SUNY) Seed Funding, United States

017 – Machine learning-aided materials data infrastructure for structural and functional complex concentrated alloys

016 – Machine Learning and SCAPS modelling for the design of the charge transport layer in perovskite solar cells

015 – Machine learning discovery and design of doped Lithium Lanthanum Zirconium Oxide (LLZO) for energy storage applications

014 - Superlubricity of graphene coatings on complex concentrated alloys using novel high temperature biowaste treatment

013 – Strain gradient plasticity and indentation size effects in complex concentrated alloys

012 – Development of low-cost sustainable dilute and complex concentrated alloys from scraps (Dirty alloy design concept)

011 – Titanium alloys and nanostructures for next generation biomedical devices (2024 - 2026)

Funding Agency - Africa - MIT Seed Funding, Massachusetts Institute of Technology, United States

010 – Investigating the irradiation stability of indigenous carbonitriding agents (2024 - 2026)

Funding Agency - Physical Metallurgy Group, Advanced Materials Division, Mintek, South Africa

009 – Application of artificial neural network for the optimization and design of electroplating processes for corrosion resistant alloys

008 – Enhancing the solidification of hypoeutectic grey cast iron through the optimization of FeSi75 inoculants (2024 - 2026)

007 – Development of Mn-based structural alloys and understanding the mechanisms for energy storage applications (2024 - 2027)

Funding Agency - National Research Foundation, South Africa

006 – Development of fully austenitic low - density steel for bio - implant applications (2024 - 2026)

005 – Welding parameters optimisation and microstructure analysis of HSLA X80 steel weld joints for oil and gas pipeline

004 – Predicting mechanical properties of Ti - 6Al - 4V components fabricated by wire - arc additive manufacturing with artificial neural network (2024 - 2026).

Funding Agency - National Foundry Technology Network, Council for Scientific & Industrial Research, South Africa

003 – Lowering high carbon levels in ferrochrome charge (2025 - 2026)

002 – Design of high chrome cast iron with variation in Vanadium and Carbon contents (2025 - 2026)

001 – Wear resistance evaluation of hybrid ceramic reinforced Hadfield steel (2024 - 2026)

Past and completed Projects

004 – High temperature biowaste treatment for superlubricious coating (2023 - 2024). Funded by the **Worcester Polytechnic Institute (WPI) Global Fellowship Program, US**

003 – Bio-tribocorrosion behaviour of low-cost titanium alloys in simulated body fluid (2021 - 2023). Funded by the **African Academy of Science's Accelerating Excellence in Science in Africa Regional Initiative in Science and Engineering (AESA - RISE) Fellowship Programme (ARPDF 18 - 03)**

002 – Evaluation of corrosion and mechanical properties of low carbon low density steel in simulated body fluids (2020 - 2021)

001 – Composition refinement of medium carbon - low alloy steels to improve wear and corrosion resistance for rail axle applications (2013 - 2020). Funded by the **DST - NRF Centre of Excellence in Strong Materials & Ferrous Metals Development Group, Advanced Materials Development, Mintek**

University Committees & Duties

002 – **Facilitator and Member, University Postgraduate Orientation Program, January 2022 – to date.** Served as a faculty representative on the task team responsible for rebranding the program. Served as a subject matter expert and facilitator for faculty-specific sessions and interdisciplinary research training workshops. The orientation program fosters academic and social integration, builds a sense of community, and familiarises students with both physical and virtual campuses, research resources, and available mental and physical health support services.

001 – **Wits Integrated Experience, June 2024 – to date.** I was the faculty representative and organised two successive programs for parents and Grades 8 – 10 learners who were part of the top applicants to university.

Faculty Committees & Duties

004 – **Member, Graduate Student Committee, March 2021 – to date.** Make academic decisions, recommend amendments to procedure and rules regarding postgraduate students in the faculty. Provide guidelines for the different schools under the faculty.

003 – **Member, Wits Readmission Committee, November 2024 – to date.** Oversee readmission appeals for approximately 50 Chemical Engineering and 20 Metallurgical Engineering students of the School of Chemical and Metallurgical Engineering on average yearly, providing recommendations to the Faculty Readmission Appeals Committee chaired by the Assistant Dean for Undergraduate Students.

002 – **Convener and Organising Committee Member, Faculty Research and Panel Discussion Series, May 2024 – to date**. Led a three-member committee to organise two interfaculty research seminars and a hybrid panel discussion on the faculty's three thematic research areas, averaging 250 participants. Now an annual event held three times a year and endorsed by the Dean of the Faculty and Deputy Vice Chancellor for Research and Innovation at Wits University, it advances the trans-, multi-, and interdisciplinary research objectives of the university.

001 – **Inaugural Editor-in-Chief, Wits Engineering and the Built Environment Review, May 2024 – to date**. I created and edited the inaugural "WEBER" newsletter for the faculty, highlighting key achievements and milestones. Endorsed by the Dean, it is now published quarterly and is slated to become the flagship journal of the faculty.

School Committees & Duties

003 – **Member, Postgraduate Student Committee, June 2024 - to date.** I play a key role in overhauling and redesigning administrative forms to streamline research processes within the school. Additionally, I am currently revising the MSc by coursework curriculum to ensure it aligns with the latest technological advancements.

002 – **Member, Research Committee, June 2024 - to date.** I play a key role in reviewing and updating policies to streamline research processes within the school. We have finalized the draft Research Booklet for the school and advanced other research initiatives (reintroduction of lunch research seminars, workshops, research showcases, publication and open access support), to drive research visibility.

001 – **Member, Marketing and Outreach Committee, June 2024 - to date.** I co-led a team that revamp the school's website and increased social media presence on LinkedIn, Facebook and X. I finalized the design of both Z-fold and standard leaflets to be distributed to high schools nationwide, aiming to boost enrollment in the Metallurgy and Materials Engineering program.

Summary of Student Advising and Examined

Number of Past PhD Advised	2
Number of Active PhD Students	8
Number of Past Masters Student Advised	7
Number of Active Masters Student	7
Number of Past Undergraduate Students Advised	5
No of Active Undergraduate Students	5
Theses, dissertations and Research reports examined	7

Theses, Dissertations and Research reports examined (Internal & External)

012 – **External,** B. Sithole (218020245), MEng (Sustainable Advanced Materials) (2026) – Integration of Machine Learning (ML) to predict and mitigate supplier-induced delays in turnkey projects, University of Johannesburg

011 – **External,** P.N. Ngema (222035806), MEng (Sustainable Advanced Materials) (2026) – Data-driven design and mechanical property prediction of heat-treated Al-Si-Mg alloys using supervised machine learning techniques, University of Johannesburg

010 – **Internal,** M.N. Madigoe (0706036P), PhD (Metallurgy and Materials Engineering) (2025) – Development of a second-generation Ti-based biomaterials for orthopaedic implants, PhD Thesis, Wits University

009 – **Internal,** S.S. Mngoma (1867059), MSc (Metallurgy and Materials Engineering) (2025) – Evaluation of microstructure and mechanical properties of 1/2Cr - 1/2Mo - 1/4V steam piping after long-term service under creep conditions, Dissertation, Wits University

008 – **External,** N.H. Maswanganyi, MEng (Sustainable Advanced Materials) (2025) – Quantification of WC microstructure for various powder mixing routes and measuring the effects of grain refiners, Mini - dissertation, University of Johannesburg,

007 – **External,** L. Mashabela (20133010), MEng (Sustainable Advanced Materials) (2025) – Tribological properties of spark plasma-sintered AlCoCrFeMnNiTi high entropy alloys, Mini - dissertation, University of Johannesburg,

006 – **External,** L.W. Simiyu, PhD (2024), Optimization of Thermo-Structural Performance of an Injection Mold Using Conformal Cooling Channels, Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya.

005 – **Internal,** L. Meyiwa, MSc (2024), Characterization of a TW R260 - 60EI pearlite rail steel with a weld gap size of 40mm and 50mm, Dissertation, Wits University

004 – **External,** Kenneth Mthokozisi Nyandoro (217018372), MEng (Physical Metallurgy) (2024) – Corrosion and Wear Characterization of Boronized Carbon steel 1020 and Stainless steel 304, University of Johannesburg, South Africa

003 – **Internal,** T.P. Modikwe (673864), MSc (2023), Characterization and surface finish evaluation of direct energy deposited AlCoCrCuFeNi high entropy alloys, Wits University

002 – **Internal,** Q. Basi (1225499), MSc (2022), Corrosion of tungsten carbide exposed to organic acid environments, Wits University.

001 – **Internal,** Bonga Wageqa (2273433), MSc (2022), Post-weld heat treatment and microstructure evolution of CP Titanium Grade 1, Wits University.

Past Doctoral (PhD) Students or Candidates

002 - Nelwalani, Ndivhuwo Brayner (589171) Graduated (2026)

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - The effect of casting parameters on mechanical properties of high chromium cast iron. Published three peer-reviewed journal articles, two manuscripts under reviewed and attended two conference proceedings.

Sustainable Ferrous Alloy Design | Microstructural Engineering | Structural Property Optimisation | Electrochemical Corrosion | Heat Treatment

001 - Maube, Shem Elahetia (E321-01-1882) Graduated (2025)

Co - Advisor, Department of Mechanical Engineering, Dedan Kimathi University of Technology, Kenya
Title - Hot workability characteristics of virgin and rejuvenated creep exhausted P91 and X20 steels - constitutive modelling and processing maps. Published three critical papers from the study before completion.

Sustainable Ferrous Alloy Design | Microstructural Engineering | Rejuvenation Heat Treatment | Constitutive Modelling | Hot Deformation

Past Postgraduate Students (Masters by Full Research (Dissertation))

007 - Thobejane, Jessica (565581) Completed (July 2026)

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Effects of spark plasma sintering (SPS) parameters on the microstructure, mechanical properties and corrosion performance of low-density steels

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

006 - Seema, Pertunia (1431415) Completed (July 2026)

Main Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Enhancing the Solidification of Hypoeutectic Grey Cast Iron through the Optimization of FeSi75 Inoculants

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

005 - Gabara, Mutshidzi Redeemer (With Distinction) (1604392) Completed (July 2026)

Main Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Design of high chrome cast iron with variation in V and C contents

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

004 - Khumalo, Thato Edward (With Distinction)(2135623) Completed (July 2026)

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Development of hybrid ceramic-reinforced Hadfield steel composite for wear resistance application

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment

003 - Mosoma, Dineo (With Distinction) (1840609) Completed (April 2026)

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Corrosion behaviour and indentation studies of spark plasma sintered Fe - Mn - Al - Cr - C based low density stainless steel

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

002 - Cader, Zaynab Adam (1408757) Completed (December 2025)

Main Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Influence of Cr/C ratio on cooling curve characteristics, microstructure, mechanical properties and corrosion Performance of high-chromium cast iron

Sustainable Ferrous Alloy Design | Microstructural Characterisation | Phase Transformation | Electrochemical Corrosion

001 - Nicola Rundora (With Distinction) (1850945) Completed (December 2023)

Co-Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Bio-tribocorrosion behaviour of low-cost titanium alloys in simulated body fluids". Graduated with Distinction (Published three papers from MSc Project

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

Past Undergraduate Students (Research)

0013 - Masangu, Shirley (2166601) **Graduated (2025)**

Main Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Wear behaviour of CrCoNi and VCoNi medium entropy alloys

Sustainable Complex Concentrated Alloys | Alloy Design | Tribology | Strain Gradient Plasticity | Microstructural Engineering | Structural Application

0012 - Philisile Sekgata (2481526) **Graduated (2025)**

Main Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Indentation size effect of 316L stainless steel

Sustainable Dilute Alloys | Alloy Design | MIcrostructural Engineering | Strain Gradient Plasticity | Structural Application

0011 - Mulenga, Vincent (2107388) **Graduated (2025)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Laves phase formation in selected refractory high-entropy alloys : implication for hardness and corrosion performance

Sustainable Complex Concentrated Alloys | Alloy Design | Microstructural Engineering | Electrochemical Corrosion | Functional Application

010 - Jhetam Kabira (Honours) (2437422) **Graduated (2024)**

Co - Advisor, Department of Speech Pathology and Audiology, Wits University, South Africa
Title - Hearing conservation coverage in undergraduate mining engineering curriculum : a case study of Wits University

Engineering Curriculum | Occupational Health | Noise Induced Hearing Loss | Mining & Mineral Industry

009 - Setumu, Boitumelo Rufus (2483953) **Graduated (2024)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Corrosion behaviour of Cu and Mo – containing low-density stainless steels in a 0.9 wt% NaCl solution

Sustainable Dilute Alloy | Alloy Design | Microstructural Engineering | Heat Treatment | Hot Deformation | Electrochemical Corrosion

008 - Mtshweni, Azari (1611172) **Graduated (2024)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Evaluating the hardness of Boronised stainless steel : analyzing the effects of materials grade and boronization time

Sustainable Dilute Alloy | Alloy Design | Microstructural Engineering | Heat Treatment | Surface Treatment

007 - Dlomo, Sizwe (1836072) **Graduated (2024)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Electroplating and analysis of ruthenium layers on 304L stainless steel

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Hot Deformation

006 - Munyangane, Vhonani (1600142) **Graduated (2024)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Determining the optimum conditions for improved corrosion performance of A516 Grade steel exposed to acidified gas liquor at different temperatures

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Hot Deformation

005 - Mosoma, Dineo (1840609), **Graduated (2022)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Hot working behaviour of low-cost non-toxic Ti-3.4Fe biomedical alloy. Published the research in International Journal of Advanced Manufacturing Technology

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Hot Deformation

004 - Komane, Takatso (1387671) **Graduated (2022)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Microstructural evolution during hot working of low density stainless steel. Published in Applied Sciences.

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

003 - Dladla, Anele (1859595) **Graduated (2021)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Evaluation of corrosion and mechanical properties of high carbon low density steel in simulated body fluids." Student was the first runner-up for best presentation during the student colloquium

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

002 - Leshetla, Mogomostsi (1063099) **Graduated (2021)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Corrosion behaviour of experimental titanium alloys in simulated body fluids" - published project in Materials & Corrosion Journal. Student was the second runner-up for best poster.

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

001 - Rundora, Nicola (1850945) **Graduated (2021)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Evaluation of corrosion and mechanical properties of low carbon low density steel in simulated body fluids Published in Applied Sciences. Published in the SAIMM Student Colloquia and won first runner for oral presentation and best presentation, Fourth Year Project at the School.

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

Active Postgraduate Students (Doctoral Candidates)

006 - Mampuru, Lebedike Andrews (1308844) Expected (Dec. 2027)

Main Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Development of Mn-based structural alloys and understanding the mechanisms for energy storage applications

Sustainable Dilute Alloy Design | Microstructural Engineering | Heat Treatment | Cryogenic Application

005 - Andrews Amoako Atta Jnr (20932332) Expected (Dec. 2027)

Co - Advisor, Department of Materials and Metallurgical Engineering, Kwame Nkrumah University of Science and Technology Gnana
Title - Chromium content on the high temperature oxidation properties of (FeNiCo)95-xMn5Crx non-equiatomic complex concentrated alloys

Sustainable Ferrous Alloy Design | Microstructural Engineering | Heat Treatment | Alloy Database Developmentt | Complex Concentrated Alloys

004 - Zuma-Rubambura, Bridget Nomshado (1375337) Expected to submit (December 2026)

Main Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Impact of the fourth industrial revolution on the recycling of 3104 (AlMn1Mg1Cu) Aluminium in South Africa

Sustainable Alloy Design | AI4Materials | Microstructural Characterisation | Impurity Tolerance

003 - Shagwira Harrision (2628323) **Expected(Dec. 2026)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Predicting mechanical properties of Ti-64 components fabricated by wire-arc additive manufacturing with artificial neural networks

Sustainable Titanium Alloy Design | Microstructural Engineering | Computation and Simulations | Additive Manufacturing

002 - Nompumelelo Venessa Nkosi (787658) **Expected (Dec. 2026)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Development of fully austenitic low-density steel for bio-implant applications

Sustainable Alloy Design | Hot Deformation | Microstructural Characterisation | Functional Materials | Biomaterials

001 - Bongani Seke Ramatsoma (201458249) **Expected (Dec. 2026)**

Co - Advisor, Department of Materials and Metallurgical Engineering, University of Johannesburg, South Africa
Title - Development of multi principal alloys for hydrogen storage

Sustainable Alloy Design | AI4Materials | Microstructural Characterisation | Functional Materials | Hydrogen Storage

Active Postgraduate Students (Masters by Full Research (Dissertation))

004 - Lungile Mncwabe (1712808) **Expected (Jul 2026)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Evaluating the Influence of Decoating Parameters to Optimize the Furnace Decoating Efficiency and Quality of Liquid AA 3104 (AlMnMgCu) and AA 5182 (AlMgMn) Recycled Secondary Aluminium Scrap

Sustainable Dilute Alloy Design | Microstructural Engineering | Electrochemical Corrosion | Heat Treatment

003 - Nomalungelo Maphanga (561416) **Expected (Jul 2026)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Leveraging Artificial Neural Networks to Optimise Ruthenium Coating Techniques for Improved Corrosion Resistance on Stainless Steels

Sustainable Dilute Alloy Design | Microstructural Engineering | AI4Materials | Electrochemical Corrosion | Heat Treatment

002 - Pleasure Mabelane (1905935) **Expected to submit (Jul 2026)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Lowering high carbon levels in ferrochrome charge

Sustainable Dilute Alloy Design | Microstructural Engineering | Structural Property Optimisation | Electrochemical Corrosion | Heat Treatment

001 - Vhonani Munyangane (1600142) **Expected (Dec 2026)**

Co - Advisor, School of Chemical and Metallurgical Engineering, Wits University, South Africa
Title - Investigation of the stress corrosion cracking of welded steel pipelines

Sustainable Ferrous Alloy Design | Microstructural Engineering | Rejuventation Heat Treatment | Constitutive Equation | Hot Deformation

Technical competency

Operating Systems	Mac OS X, Windows and Linux
Softwares	Proficient MS Office, MS Teams, Learning Management Systems, Research Databases
Management and Social Competencies	Cross Functional Collaborator, Project Management, Scientific and Technical Writer
First Principle Calculations	Material Studio(CASTEP, Molecular Dynamics), LAMMPS
Materials Packages	Thermo-Calc simulation
Characterisation Techniques	SEM-EDX, XRD, TEM, AFM, Optical Microscopy
Metal forming	Sand casting, Rolling, Forging
Heat treatment	Quenching, Tempering, Normalising, Annealing
Mechanical testing	Tensile, Fatigue, Fracture and Impact Toughness, Sliding Wear, Nanoindentation
Corrosion testing	Potentiodynamic, Immersion

Peer Review, Editorial Boards and Conference Organisation

2025 -	**Reviewer**, The Canadian Journal of Chemical Engineering (IF - 1.9), Wiley
2025 -	**Reviewer**, Results in Engineering (IF - 7.9), Elsevier
2025 -	**Reviewer**, Sustainable Development (IF - 8.2), Wiley
2025 -	**Reviewer**, Steel Research International (IF - 2.5), Wiley
2025 -	**Reviewer**, Journal of Plastic Film and Sheeting (IF - 2.6), Sage
2025 -	**Reviewer**, Materials Today Communication (IF - 4.5), Elsevier
2025 -	**Reviewer**, Journal of Engineering and Applied Science, Sage
2025 -	**Reviewer**, International Materials Review (IF - 20.6), Sage
2025 -	**Reviewer**, Emergent Materials (IF - 4.1), Springer Nature
2025 -	**Reviewer**, Ceramics International (IF - 5.6), Elsevier
2024 -	**Reviewer**, Computer Methods in Biomechanics and Biomedical Engineering (IF - 1.7), Taylor and Francis
2024 -	**Reviewer**, Advanced Engineering Materials (IF - 5.5), Wiley
2024 -	**Editor**, Journal of Construction and the Built Environment
2024 -	**Subject Matter Expert Reviewer**, South African ESKOM Expo for Young Scientists
2024 -	**Subject Matter Expert Reviewer**, South African National Research Foundation (Scholarship, Grants and Ratings)
2024 -	**Organizing Committee Member and Advisor**, 12th International Conference of the African Materials Research Society, Kigali, Rwanda
2024 -	**Guest Editor**, Special Issue, Frontiers in Manufacturing Technology, Materials Forming and Removal
2024 -	**Guest Editor**, Special Issue, Discover Applied Sciences, Springer Nature
2024 -	**Reviewer**, Acta Biomaterialia (IF - 9.6), Elsevier
2024 -	**Reviewer**, Journal of Electroanalytical Chemistry (IF - 4.1), Elsevier
2023 -	**Reviewer**, Journal of Phase Equilibria and Diffusion (IF - 1.7), Springer Nature
2023 -	**Reviewer**, npj Materials Degradation (IF - 7.5), Springer Nature
2023 -	**Committee Member**, Scientific Electronic Library Online (SciLEO) South African Chapter
2022 -	**Guest Editor**, Special Issue, Applied Sciences (IF - 2.8), MDPI
2022 -	**Secretary & Technical Committee Member**, International Conference on Sustainable Engineering & Materials Development (ICSEMD 2023), Virtual Conference, May 24 - 26, 2023
2022 - 2023	**Guest Editor**, Special Issue on Advanced Metal Forming and Smart Manufacturing in Applied Science
2019 -	**Reviewer**, Scientific African (IF - 3.3), Elsevier
2019 -	**Reviewer**, Journal of Materials Engineering and Performance (IF - 2.4), Springer Nature
2020 -	**Editorial Board Member**, Journal of the Southern African Institute of Mining and Metallurgy (IF - 1.9)
2018 -	**Reviewer**, Springer MRS Advances (IF - 0.9), Springer Nature
2018, 2019	**Technical Committee and Reviewer**, Conference of the South African Advanced Materials Initiative
2015	**Organising Committee Member**, Young Professional Conference and Student Colloquium, The Southern African Institute of Mining and Metallurgy (SAIMM)
2014 - 2018	**Champion & Committee Member**, Education Focus Group, Young Professional Council, SAIMM

Professional affiliations and extra curricula activities

2022 -	**Professional Member (MIEAust)**, Engineers Australia
2020 -	**Professional Member**, Institute of Materials, Minerals & Mining (IOM3)
2020 -	**Professional Member**, Microscopy Society of Southern Africa
2012	**Complimentary Member**, Corrosion Institute of Southern Africa (CorrISA).
2012 –2014	**Chairperson**, Wits University Table Tennis Club (WUTTC).
2012 –2013	**Chairperson**, Postgraduate Association, School of Chemical and Metallurgical Engineering, Wits University.
2008 – 2009	**Public Relations Officer**, International Association of Exchange of Students for Technical Experience (IAESTE), KNUST Student Chapter, Kumasi, Ghana.
2008 – 2009	**Chairperson**, Judical Commitee, Materials Engineering Student Association (MATESA), KNUST, Kumasi, Ghana.
2008 – 2009	**Student Member**, The Engineers Institute of Australia (Membership No : 3453013), Australia.

Short courses, workshops & Certificates

2023	**Phase Diagrams, Classical and Computational Thermodynamics,** Materials Science Institute Winter School on Materials Chemistry, Tergernsee, Germany, Certificate of Participation
2021	**Enhancing Postgraduate Supervision,** The Centre for Learning, Teaching and Development, Wits University (Certificate of Competence, Grade - 79% (Distinction))
2021	**Academic Advising,** Centre of Part-Time Studies, University of the Free State, Bloemfontein, South Africa (Certificate of Competency, Grade - 78% (Distinction))
2020	**Occupational Health & General Housekeeping,** Certificate of Competence (NQF Level 3)
2020	**First Aid Level 1,** Certificate of Competence (NQF Level 1)
2019	**Business Improvement and Advisory Structural Thinking**, Hatch Structural Courses and on-the-job training
2019	**Brownpapaer workshop, Management Operating System and Gap Analysis**, Hatch Structural Courses and On-the-job training
2019	**Business Diagnostics, Value Driver Tree and Effective Business Idea Generation Session**, Hatch Structural Courses and On-the-job training
2019	**Effective Presentation in Management Consulting**, Hatch Structural Courses and On-the-job training
2019	**Problem Solving in Management Consulting**, Hatch Structural Courses and On-the-job training
2018	**ThermoCalc simuation Workshop,** School of Chemical and Metallurgical Engineering, Wits University.
2016	**International Workshop on Tribocorrosion Techniques,** Resolution Circle, University of Johannesburg.
2012	**Corrosion Engineering,** Corrosion Institute of Southern Africa, Midrand, South Africa.
2012	**Pan African School of Materials,** African University of Science and Technology (AUST).
2011	**DST-TAP Foundry Course on Metallography, Interpretation and Measurement of Microstructure and Fractures,** Mintek.
2011	**SEM Operation and EDX Analysis Workshop,** University of Botswana & Botswana Bureau of Standards, Gaborone.
2009	**Advanced Water and Wastewater Treatment,** International Institute of Water and Environmental Engineering (2iE), Ouagadougou, Burkina Faso, African Renaissance Institute of Science and Technology (ARIST).

Community Service

2014-2018	**Founding Member & Champion, Mentoring & Education Focus Group**, Young Professional Council, Southern African Institute of Mining and Metallurgy. Convened the first ever Metallurgy and Mining Engineering education working group focused on addressing challenges facing undergraduate and postgraduates.
2014	**Founding Member and Director**, Research and Projects, Helpers Hand Foundation. An organisation that organises educational programmes and mobilises resources for pupils in the basic schools in Ghana.
2007 – 2009	**Founding Member and Organising Secretary**,Youth Impact Regional Program.
2009 – 2012	**Public Relations Officer**, Science and Technology Advocacy Renaissance for Africa.
2008 – To Date	**Co-Executive Director**,WininLuv Foundation, Non-governmental organisation that grants full or partial scholarships to less-privilege students.

Citations summary, H-indices & Number of Publications

Citations (Google Scholar)	860
H-index (Google Scholar)	16
Publications (Google Scholar)	90
Citations (Scopus)	590
H-index (Scopus)	13
Publications (Scopus)	69

Peer-reviewed Publications statistics and summary

Peer-reviewed Journal Articles	65
Peer-reviewed Book Chapters	15
Peer-reviewed Conference Proceedings & Workshops	31
Manuscript under review	10
Book Chapters under review	8
Book under preparation	1

Manuscript under review

003 – Velaphi Matejeke, Sodiq Kareem, **Desmond Klenam**, Josias van der Merwe, Bharat Gwalani, Japheth Obiko & Michael Bodunrin **Using dynamic materials modelling approach to establish critical parameters for hot coiling of spring steels**, *Manufacturing Review, 2026 (Under review)*.

002 – **D.E.P. Klenam**, M. Erol, T.K. Asumadu, B. Young, M.O. Bodunrin, S. Gorsse, N, Rahbar, D.E.J. Armstrong, A.J. Wilkinson & W.O. Soboyejo, **Sustainable design of complex concentrated alloys via scrap metals - review of alloying philosophies, opportunities and challenges**, *Materials Today*, (IF : 26.4). Revised manuscript submitted

001 – T.K. Asumadu, **D.E.P. Klenam**, M. Vandadi, K. Adinkra-Appiah, K. Mensah-Darkwa, E. Gikunoo, S. Kwofie, N. Rahbar & W.O. Soboyejo, **Two-dimensional carbon-based materials and macroscale superlubricity - milestones, opportunities and challenges**, *Sustainable Materials and Technologies*, (IF : 8.4).

Peer - review Journal publications

2026

070 – **D.E.P. Klenam**, T.K. Asumadu, M.O. Bodunrin & W.O. Soboyejo, **Comparative assessment of dilute alloys with complex concentrated alloys - design principles, processing, mechanisms, properties and sustainability**, *Journal of Alloys and Compounds Communication, 2026 (Accepted and under production)*.

069 – D. Mosoma, V. Munyangane, R. Sule, **D. Klenam**, M.A. Okoro & M.O. Bodunrin, **Spark plasma sintering of low density stainless steel - optimization of sintering parameters**, *Advances in Materials Science and Engineering, 2026 (Accepted and under production)*.

068 – **Desmond Edem Primus Klenam**, Nana Kwabena Adomako, Seok Su Sohn & Raymond Kwesi Nutor, **Unlock superplasticity in medium and high-entropy alloys**, *Communication Materials, 7 (186) 2026*.

067 – Kicoun Jean-Yves N'Zi Toure, Alassane Compaore, **Desmond Klenam**, Tabiri Kwayie Asumadu, John David Obayemi, Merenga Abdallah Sarroney, Edja Florentin Assanvo, Nima Rahbar, Winston Oluwole Soboyejo **A Study of the effect of cashew nutshell epoxy resin and graphene reinforcement on soy flour-based bio** *Results in Materials, 100978, 2026*.

066 – Joseph Dela Aziafor, Bongani Ramatsoma, Nihad Omer Hassan, Abdulrahaman Koko, Michael Bodunrin & **Desmond Klenam, Magnesium-Based Hydrides and Complex Concentrated Alloys : A Review of Advancements and Pathways for Next-Generation Hydrogen Storage Materials**, *Review of Materials Research, 2026 (In Press, Journal Pre-proof online 7 June 2026)*

065 – Bernice Ngwi Abraham, Elvis Twumasi, **Desmond Edem Primus Klenam**, Tabiri Kwaiye Asumadu, Abdulhakeem Bello, Vitalis Chioh Anye, Nancy A. Burnham, Rodica Neamtu, Winston Oluwole Soboyejo, **Machine Learning Guided Design of Doped Lithium Lanthanum Zirconium Oxide (LLZO) for Improved Performance**, *Energy Storage, 2026 (Accepted and under production)*.

064 – N. Nkosi, D. Essa, A. Moalodi, J. Lawal, Y. Choonara, **D. Klenam**, M.O. Bodunrin, **On the Cytotoxicity Assessment and Indentation Size Effect of Low-Cost Experimental Implant Alloys**, *ACS Materials Au, 2026 (Accepted and under production)*.

063 – N.B. Nelwalani, N.P. Bhembe, Z.A. Cader, M.O. Bodunrin & **D.E.P. Klenam**, **Effect of Chromium-to-Carbon Ratio and Carbide Volume Fraction on the Three-body Abrasion Wear and Corrosion Behavoiur of High Chromium White Cast Iron**, *Progress in Engineering Science, 2026, (Accepted and Under Production)*,(IF : 2.8).

062 – O.J. Lawal, P.A. Olubambi, **D.E.P. Klenam**, M.O. Bodunrin & S.S. Lephuthing, **A review on low-density steels - effect of processing techniques and parameters on microstructure and mechanical properties**, *Manufacturing Review, 13(3) 2026, 2025031*,(IF : 2.8).

061 – Nicola Rundora, **D.E.P. Klenam**, Oluwasegun Falodun, Maria Mathabathe, Vusumuzi Sibanda, and Michaee Bodunrin **Tribocorrosion response of Fe-modified titanium alloys in simulated body fluids with varying glucose concentrations**, *Journal of Applied Biomaterials & Functional Materials 2026 (Accepted and under production)*

060 – D. Mosoma, **D.E.P. Klenam**, M.A. Okoro, S.R. Oke, and M.O. Bodunrin **On the spark plasma sintering of Mo-and-Cu containing low-density stainless steel : influence of sintering parameters on microstructure, densification and hardness considerations**, *Int J Adv Manuf Technol (2026), (https://doi.org/10.1007/s00170-026-17793-4)*

059 – O.J. Lawal, S.S. Lephuthing, P.A. Olubambi, M.O. Bodunrin & **D.E.P. Klenam Corrosion behaviour of low-density steels for biomedical applications - a critical review of composition and microstructural effects**, *Next Research, 7, 2026, 101459*,(IF : 3.5).

058 – Nihad Omer Hassan, Afaf Ghais, Muhammad H. M. Ahmed, Mahmoud Adam, Razan Ahmed, Amel Abdelatti, **D.E.P. Klenam**, M.O. Bodunrin, Abdalrhaman Koko **Density Functional Theory Insights into the Structure, Electronic and Mechanical Properties, Thermodynamics, and Diffusion of High-Entropy Alloys for Hydrogen Storage : A Review**, *Int. J. Hydrogen Energy, 217, 2026, 153928*, (IF : 8.1)

057 – N.K. Ankah, Z.M. Gasem,T.K. Asumadu, M.O. Bodunrin, **D.E.P. Klenam** &W.O. Soboyejo, **Investigation of Vanadium-Induced Hot corrosion of 8YSZ and MgO-8YSZ composite powder for thermal barrier coatings application,** *Materials Today Communication, 51, 2026, 114802*

056 – Z.A. Cader, O.S. Bamisaye, **D.E.P. Klenam**, M.O. Bodunrin & O. Omole, **Influence of Cr/C ratio on microstructure and corrosion of hypo-eutectic HCCIs**, *Corrosion Engineering, Science and Technology, 2026 (Accepted and under production)*.

055 – H.K. Weefar, T.K. Asumadu, **D.E.P. Klenam**, F.K.E. Kra, D.M. Abro, W.O. Soboyejo, **Strain Gradient Plasticity Phenomenon in Construction Steels : Effects of Heat Treatment on Microstructure and Stress-Strain Behavior**, *Journal of Materials Research and Technology, 40, 2026, 2789 – 2804.*

054 – M. Vandadi, F. Ghajari, T.K. Asumadu, **D.E.P. Klenam**, W.O. Soboyejo & N. Rahbar, **Dislocation analysis in CrCoNi medium entropy alloy using nanoindentation and molecular dynamics simulations**, *Proceedings of the Royal Society A, 482 (2333), 2026, 20250757.*

2025

053 – **D.E.P. Klenam**, **Artificial Intelligence in the Development of Structural and Functional Materials : A Transformative Frontier and Complementary Enabler of the Rational Alloy Design Framework**, *Next Research, 3, 101157, 2025*.

052 – Obiko, Japheth, Shongwe, Mxolisi Brendon, Malatji, Nicholus, Tawanda, Marazani, Bodunrin, Michael, **Klenam, Desmond**, Hot Deformation of AISI 4340 Steel From a Dynamic Material Modeling Perspective, Advances in Materials Science and Engineering, 6644873, 2025.

051 – N. Maphanga, **D. Klenam**, M. Bodunrin, R. Diale, J. Moema, **Application of artificial neural networks in predicting and optimising electroplating parameters - a systematic review,** *MATEC Web of Conference, 417, 03017, 2025*.

050 – P. Seema, **D. Klenam**, M. Bodunrin, C. Hattingh, J. Moema, M. Phasha, **Thermal and mechanical properties of sustainable rigid polyurethane foam composites reinforced with coffee husk fillers,** *MATEC Web of Conference, 417, 03017, 2025*.

049 – L. Mampuru, **D. Klenam**, M. Bodunrin, J. Moema, M. Phasha **Manganese effect on room and cryogenic temperature impact toughness of thermomechanical processed Fe-Mn binary alloys and commercial 9 wt% Nickel alloy,** *MATEC Web of Conference, 417, 03017, 2025*.

048 – Kicoun Jean-Yves N'Zi Toure, Alassane Compaore, **Desmond Klenam**, Tabiri Kwayie Asumadu, John David Obayemi, Merenga Abdallah Sarroney, Edja Florentin Assanvo, Nima Rahbar, Winston Oluwole Soboyejo **Thermal and mechanical properties of sustainable rigid polyurethane foam composites reinforced with coffee husk fillers** *Polymer Testing, 153, 109028, 2025*.

047 – Japheth Obiko, Micheal Bodunrin, **Desmond Klenam**, Brendon Mxolisi, Malatji Nicholus, **Hot workability behaviour of AISI316 stainless steel : constitutive analysis, dynamic material modelling, and finite element simulation** *The International Journal of Advanced Manufacturing Technology., 139, 2393 - 2408, 2025*.

046 – John Adjah, Benjamin Agyei-Tuffour, Ridwan A Ahmed, **Effects of external pressure on all-solid-state batteries : comprehensive review and analysis Desmond Edem Primus Klenam**, David Dodoo-Arhin, Emmanuel Nyankson, Kwadwo Mensah Darkwa, Winston Wole Soboyejo, *Energy Storage Materials, 104461, 2025*.

045 – Fatemeh Ghajari, Mobin Vandadi, Tabiri Kwayie Asumadu, **Desmond Klenam**, Winston Soboyejo, Nima Rahbar, **Investigating Carbon Coating on Ni-Invar and Ti–6Al–4V Surfaces for Low Friction Performance** *Langmuir, 41(32), 21425-21434, 2025*.

044 – B.S. Ramatsoma, M.E. Makhatha, **D. Klenam** & M.O. Bodunrin , **Role of compositionally complex and high entropy alloys for hydrogen storage : A bibliometric and mechanistic assessment** *Renew. Sustain. Energy Rev., 222, 115903, 2025*.

043 – Nestor K. Ankah, Z.M. Gasem, T.K. Asumadu, M.O. Bodunrin, **D. Klenam** & W.O. Soboyejo **Early-stage mechanistic insights into vanadium-induced hot corrosion of yttria-stabilized zirconia thermal barrier coatings**, *Prog. Eng. Sci., 2(4) 100157, 2025*.

042 – J. Obiko, M. Ndeto, J. Mutua, B. Shongwe, N. Malatji, M. Bodunrin & **D. Klenam Failure analysis of geothermal API 5L grade B steel pipeline**, *Eng. Solid. Mech., 13, 259-266, 2025*.

041 – Compaore Alassane, Kicoun Jean-Yves N'Zy Toure, **Desmond Edem Primus Klenam**, Tabiri Kwayie Asumadu, John David Obayemi, Nima Rahbar, Charles M Migwi, Abdallah Sarroney Merenga, Winston Oluwole Soboyejo **Performance of Foam Concrete Containing Relatively Low Temperature Calcined Clay as Partial Replacement of Portland Cement**, *J. of Mater. Res. Technol., 38, 1761-1781, 2025*.

040 – **D.E.P. Klenam**, O.S. Bamisaye, T.K. Asumadu, M.O. Bodunrin & W.O. Soboyejo, **Solving the strength - ductility trade-off using complex concentrated alloy design strategy - an overview**, *Smart Materials in Manufacturing, 3, 100091, 2025*.

039 – T.W. Awotwe, G.K. Mukondeleli, N. Ndou, R.W. Maladzhi, **D.E.P. Klenam**, S. Junaid, F. Azmat, R. Ghannam & R. Tarip, **An unsupervised machine learning approach to understand staff perception on project based learning using CDIO framework in African Engineering Education context - The case of South Africa**, *SEFI Journal of Engineering Education* (Accepted and under production).

038 – S.A. Osafo, T.K. Asumadu, **D.E.P. Klenam**, P. Etinosa, J.D. Obayemi, B. Agyei-Tuffour, A. Yaya, D. Dodoo-Arhin & W.O. Soboyejo, **Tribological Properties of Hydroxyapatite-Coated Nanorods on Ti-6Al-4V Surfaces,** *Scientific Reports, 15(1) 19113, 2025*

037 – A. Compaore, K.J.N. Toure, **D.E.P. Klenam**, A.S. Merenga, T.K. Asumadu, J.D. Obayemi, N. Rahbar, C. Migwi & W.O. Soboyejo, **Foam concrete with mineral additives - from microstructure to mechanical/physical properties, workability and durability**, *Open Ceramics, 23, 100812, 2025*

036 – I.E. Kalu, S.M. Abolarin, **D.E.P. Klenam**, E.Y. Ishidi & K.K. Alaneme, **Comprehensive Review on Fitness-for-Service Assessment of Corroded Pipelines - Focus on Model Validation and Industry Applications**, *Journal of Pipeline Science and Engineering, Pre-proof online*

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[027] – (**Resource Person/Facilitator**), **D Klenam**, Early Career Researcher Mentorship and Training for over 50 early career researchers and post-doctoral fellows, Africa Engineering and Technology Network (AFRETEC) Knowledge Creation Workshop, University of Nairobi, Nairobi, Kenya, 18 - 25 October 2025

[026] – (**Keynote Address**) **D.E.P. Klenam**, From Scales to Surfaces – Integrating Indentation Mechanics and Sustainable Superlubricity for Advanced Manufacturing, 7th Annual International Engineering Conference (EC2025), University of Nairobi, Nairobi, Kenya, 21 - 25 October 2025

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[08] – **D.E.P. Klenam**, S.I. Hango & M.O. Bodunrin, **Complex concentrated alloys as hydrogen storage materials - a mini review of milestones and challenges for a green Africa**, International Conference on Hydrogen-based Energy Systems (ICHES 2022), Khomas Region, Windhoek, Namibia.

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