

PROVISIONAL GRADUATION LIST

**Graduation Date: 09 December 2024
Time: 09:30**

The purpose of the provisional list is for you to check that **all** of your personal and academic details such as your name(s) and the title of your thesis, as well as the record of supervisor(s) is correct. Your names should appear as reflected in your ID or Passport. It is too late to correct these when the final graduation list is published.

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

DEAN: PROFESSOR T MAJOZI BScEng(UND) MScEng(UND) PhD (UMIST) CEng PrEng FICChemE FAAS MASSAf FWISA FSAAE

Doctor of Philosophy

CHILOANE-NWABUEZE, Salome

School of Civil and Environmental Engineering

THESIS: A Decision Support Framework for Grading of Civil Engineering Contractors and Evaluation of Infrastructure Project Performance

The study was motivated by the level of inefficiencies in the South African civil engineering construction sector. To achieve the study objectives, a questionnaire was deployed to industry role players followed by a multi-criteria decision-making framework using the Analytical Hierarchy Process (AHP). The adoption of these methodologies has enabled the framework for registering, grading, and evaluating of project performance of contractors to be developed. Supervisor: Professor A Fitchett

FAHMY, Randa Mahmoud

School of Architecture and Planning

THESIS: Cultural Memories and Place-Identity: A case study of Syrian Refugees' resettlement and acculturation strategy in Egypt

Focusing on Syrian Refugees, the thesis explores how refugees of Arab origin(s) retrieved perceived authentic architectural heritage from their cultural memories in the processes of acculturation, and when constructing new place identity in the host country Egypt, where they found refuge.

Supervisor: Professor N Elleh

GILAYENEH, Victor Saye

School of Civil and Environmental Engineering

THESIS: Prospects of Gibbsite-Rich Laterite as a Source of Aluminosilicates in Geopolymerisation

The study investigated the use of gibbsite- or aluminium-rich laterite in the development of sustainable cement-based materials. Although not ideal for geopolymerisation, calcined aluminium-rich laterite was found to be suitable for low-strength construction applications. The findings also indicate that aluminous laterite can, in addition to being used to develop hybrid binders, also be used as an alternative supplementary cementitious material in concrete.

Supervisors: Professor M Otieno and Professor S Nwaubani

MALETE, Refiloe Minah

School of Construction Economics and Management

THESIS: An analysis of the effectiveness of infrastructure delivery management system in South African government

The study examines infrastructure delivery in the public sector and challenges that hinder the effective execution of infrastructure projects. The report presents an integrated delivery framework for infrastructure. The study adds to the literature on infrastructure delivery techniques and contributes to the development of efficient and sustainable methods for delivering infrastructure.

Supervisors: Dr N Khatleli and Professor D Root

MBINZA, Zenzile Emile

School of Architecture and Planning

THESIS: The dynamics of place branding in the City of Johannesburg: 1994-2019

The candidate's thesis is an inquisitive journey. It gets into the heart of the literature on place branding both in the developed and developing world. The thesis unravels the historical motivations, twist-and-turn dynamics, and complexities of place branding in Johannesburg from 1994 to 2020, using interviews, archives, and a detective intuition.

Supervisor: Professor M Sihlongonyane

MOLOI, Nosipho Prudence

School of Construction Economics and Management

THESIS: Essays on the Corporate Governance Evolution and South African Real Estate Investment Trusts (REITs)

The candidate investigated the impact of corporate governance on the performance of Real Estate Investment Trusts (REITs) in South Africa. Using econometric methods on REITs stock price, the results examined the role of corporate governance and corporate social responsibility in explaining REITs' performance. The results from this work are published in leading publications outlets globally.

Supervisors: Professor O Akinsomi and Dr W Wong

MONAKEDI, Tshepo Albia

School of Architecture and Planning

THESIS: Understanding the contribution of informal non-state actors in the governance of cities of the global South through informal institutions: The case study of informal car guarding in Johannesburg, South Africa

This thesis is about the contribution of informal non-state actors in the functioning of cities in the global South. Using the case study of Informal Car Guarding in Johannesburg, South Africa, the thesis forms part of urban planning theory that is informed by the daily realities of people who interact through informal institutions.

Supervisor: Professor A Karam

MOODLEY, Prebantha

School of Chemical and Metallurgical Engineering

THESIS: The Water Impact of Carbon Dioxide Avoided: A New Metric to Understand the Trade-Offs Between Water Usage and Carbon Capture Technologies in Fossil-Based Power Generation

This research explores the development of a new sustainability metric, Water Impact of Carbon Dioxide avoided (WICa), to evaluate the potential increase in water use versus the reduction in carbon dioxide emissions in carbon capture technologies

Supervisor: Professor K Harding

MUDAVANHU, Tabani Bernard

School of Mechanical, Industrial and Aeronautical Engineering

THESIS: Towards a generic model to guide and sustain enterprise strategy implementation

This Thesis provides a ground-breaking artifact towards resolving the ongoing challenges to successful strategy implementation, by applying for the first time an Engineering Enterprise perspective. Thus, it courageously delves into and explores for the first time the deepest organisational level, the ontological level, and uncovers a critical relationship with implementation. This knowledge provides a fundamentally new direction for researchers and practitioners in this field.

Supervisor: Dr B Emwanu

MUZANENHAMO, Chido Anna Maria

School of Architecture and Planning

THESIS: Gendered strategies and aspirations of black women inhabiting borderland spaces: A case study of Musina Local Municipality

This research focuses on the construction of black femininity within an African borderland. Conducted in the Musina Local Municipality on South Africa's border with Zimbabwe, the study explores a double-borderland - an overlap of transnational and urban-rural interfaces. It shows how black women are caught in between idealized conceptualizations of black femininity and the pressures of assimilating into a borderland society.

Supervisors: Professor P Harrison and Dr M Rubin

MYBURGH, Sabrina Gabrielle

School of Mechanical, Industrial and Aeronautical Engineering

THESIS: Bodies of cunicularity in supersonic flow

The ability of porous media in supersonic flows to reduce the drag a body experiences, was investigated. The drag-reducing effect of organised porosity within conic bodies was demonstrated through numerical and experimental investigations. From this study, the three most significant contributions to drag were identified and modified, yielding a body with organised porosity that has significantly reduced drag.

Supervisor: Professor C Law

NAICKER, Thilgavathie

School of Architecture and Planning

THESIS: Place leadership for the governance of complex urban agglomerations

The thesis explores the concept of 'place leadership' and its relevance within a complex and dynamic socio-political space such as the Gauteng City-Region. It uses three thematics to analyse place leadership, namely 'temporality', 'crisis', and 'transculturality'. By incorporating these thematics, the concept has value for city-regions in the Global South.

Supervisor: Professor P Harrison

OMALANGA, Sendango Landry

School of Civil and Environmental Engineering

THESIS: Using a hybrid adsorption-membrane filtration system to produce biologically stable drinking water

In his study, Mr Omalanga investigated the effectiveness of a hybrid adsorption-membrane filtration system in lowering the bacterial regrowth potential in portable water. Ready-made multi-walled carbon nanotubes were non-covalently functionalized and used as adsorbents whereas polysulfone membranes were produced by phase inversion method using N, N-dimethylformamide solvent. The results of the study showed that the hybrid system adopted can effectively remove two forms biodegradable organic matter from water. Therefore, the system can be used to produce biologically stable drinking water.

Supervisors: Dr P Biyela and Professor G Simate

ONYEDIKACHI, Samuel Nnamdi

School of Electrical and Information Engineering

THESIS: Estimating resistance and performance of earthing systems electrode in variably saturated soil conditions
Regular onsite inspection and measurement of transmission tower earthing resistance are recommended to ensure system reliability and operational safety over seasonal variations. However, integrity tests are costly and time-consuming. This research offers a new method, using subsoil properties and climate conditions to estimate earthing resistance and performance, minimizing the requirement for extensive onsite measurements.

Supervisor: Professor G Gomes

OSMAN, Amani Alged Fetaha

School of Electrical and Information Engineering

THESIS: Physical layer security with NOMA in mixed RF-FSO systems

This study investigates the security of a multiple-input multiple-output based non-orthogonal multiple access system in a mixed radio frequency and free-space optical system from a physical layer security perspective in the presence of a single and multiple eavesdroppers. Statistical properties of the RF and FSO links are derived in terms of the PDF and CDF of the SNRs at the receivers' ends and subsequently used to establish theoretical expressions of the secrecy performance measures. Monte Carlo simulations confirm the accuracy of the proposed analytical frameworks.

Supervisors: Professor F Takawira and Professor J Moualeu

RABOTHATA, Mahlatse Solomon

School of Mechanical, Industrial and Aeronautical Engineering

THESIS: Effects of ni-mo binder and laser surface engineering of nbc based cutting inserts during face-milling of automotive grey cast iron

The candidate's thesis focuses on the development of novel niobium carbide-nickel/molybdenum (NbC-Ni/Mo) cermet based cutting inserts as alternatives to conventional tungsten carbide-cobalt (WC-Co) inserts for face-milling automotive grey cast iron (a-GCI). By utilising advanced techniques such as pulsed electric current sintering (PECS), composition manipulation and femtosecond laser surface modification (LSM), the research achieved significant improvements in mechanical properties, abrasion wear resistance, machining performance, and energy efficiency. This work contributes to the field of hard materials and engineering, offering valuable insights for future advancements in cutting tool technologies.

Supervisors: Professor C Polese and Professor R Genga

SHONIWA, Kuda John

School of Construction Economics and Management

THESIS: The use of Integrated Project Delivery (IPD) to reduce construction claims in South African mining capital projects

This study explores the use of IPD benefits to reduce construction claims in South African mining capital projects. The findings show an opportunity to use IPD aspects and infusing them into the Design-Bid-Build method. The candidate then developed a new framework that uses IPD collaboration and integration benefits as remedies to causes of construction claims.

Supervisors: Professor S Laryea and Professor E Saghatforoush

THERON, Patricia Frances d'Altera

School of Architecture and Planning

THESIS: Lagos as a Metropolitan Assemblage: Reading the layering and complexity in urban infrastructure

This thesis uses "assemblage" to explain an emergence of process and pattern in the urban setting of Lagos, as revealed through systems of physical infrastructure. The colonial World War I port and the independence era oil-wealth bridge and ring-road projects of the 1970s are read as infrastructural assemblages, involving complex relationships of actors, institutions, and material networks.

Supervisors: Professor N Elleh and Professor P Harrison

ZWANE, Sibongile

School of Construction Economics and Management

THESIS: A comparative approach to market-wide herding

The thesis examined market-wide herding in the US, UK, South Africa and Taiwan across bonds, equities, and listed real estate. It found persistent herding within and between indices, with herding more pronounced in listed real estate. Herding is more prevalent in emerging markets, suggesting investors should mitigate risks through product integration.

Supervisor: Dr T Ramantswana

FACULTY OF HEALTH SCIENCES

DEAN: PROFESSOR SA MADHI MBBCh MMed PhD (Witwatersrand) FCPaed(SA)

Doctor of Philosophy

ABDALLA, Yosra Mahjoub Ahmed

Pharmacy and Pharmacology

THESIS: A thermo-responsive scleral device for the management of ocular tumours

This project involved the exploration of a thermo-responsive hydrogel with pH-responsive nanoparticles for targeted treatment of ocular surface tumours using interferon alpha. The hydrogel and nanoparticles were synthesized and characterized, followed by an assessment of cellular absorption, ocular pharmacokinetics, using a rabbit model. The system demonstrated persistent release of the drug in vivo and no significant inflammatory response in the conjunctivae or sclera, indicating its potential as a therapy option for specific ocular surface tumour sites.

Supervisor/s: Aspf P KondiahDr L Du Toit

ABDELGADER, Ahmed Abdalla Bakheit

Pharmacy and Pharmacology

THESIS: A multi-unit, polymer-based, prolonged-release, intrauterine device for the relief of the genitourinary syndrome of menopause

The genitourinary syndrome of menopause (GSM) is a condition affecting millions of women globally. Despite its occurrence, there is a lack of effective long-term treatments that consider patient safety and compliance. This study addresses this concern through the development of an implantable, multi-unit platform for the site-specific delivery of hormonal drugs. Overall, this system presents a promising solution for GSM treatment, while potentially revolutionising drug delivery in the genitourinary tract through the development of a versatile targeted, controlled release system.

Supervisor/s: Dr M Govender, Dr P Kumar and Dr Y Choonara

ATIBA, Foluso Ayobami

Anatomical Sciences

THESIS: Effects of aqueous extract of kolanut (*Cola nitida*) on Sprague Dawley dams and exposure on the hippocampus of the progeny

This thesis explored the effects of prenatal kolanut (*Cola nitida*) exposure, on the hippocampus of Sprague Dawley rat progeny. Prenatal kolanut consumption by Sprague Dawley dams adversely affected food intake. The treatment also adversely affected behaviour indices, neuronal morphology, decreased neurogenesis and neuroplasticity in the progeny. It induced oxidative stress and significant downregulation of *cfos*, *cjun*, *creb1*, *dlg3*, and *dlg4*, genes, important for normal synaptic-neuronal development, resulting in dysmorphology of dendrites and spines.

Supervisor/s: Dr E Mbajorgu and Prof A Ihunwo

BARNIGHAUSEN, Kathryn Elizabeth

Public Health

THESIS: Pre-exposure Prophylaxis (PrEP) for HIV prevention in Eswatini: understanding the barriers, facilitators and opportunities for women

This thesis examines findings from the formative qualitative component of the Eswatini Pre-exposure prophylaxis(PrEP) demonstration project. Using 217 semi-structured in-depth interviews with health care workers, stakeholders and PrEP uptake, decline, discontinuation and continuing clients, the thesis describes where ζ along the HIV prevention cascade ζ gaps in service provision, demand creation, access, and retention in care are visible. The outcomes of the thesis contributed to the national scale up of PrEP in Eswatini and have informed ongoing programmatic and implementation adaptations.

Supervisor/s: Dr K Kahn

BLANCHARD, Charmaine Louise

Internal Medicine

THESIS: Developing an intervention to improve informed decision-making for oncology patients in South Africa. This thesis applies the Intervention Mapping framework to understand the challenges oncology patients face in making informed decisions and utilises theory-based strategies to address behaviour change determinants in developing a suitable decision support program. Findings were that patients have high information needs, however patient-oncologist communication is constrained by language and cultural discordances, and limited consultation time. The resulting oncologist communication and patient coaching program will provide a culturally sensitive patient-centred approach to making informed cancer treatment decisions.

Supervisor/s: Dr M Patel and Prof S Norris

BLOCH, Nerissa Wendy

Virology

THESIS: Heat shock factor (HSF) expression and its effect on life table parameters in the main malaria vector *Anopheles funestus*

Anopheles funestus is a major malaria vector and is understudied due to the species' natural resistance to laboratory colonisation. Temperatures worldwide are rising steadily, which can affect mosquito distribution and behaviour. This study explored heat shock factor (HSF), a transcription factor, which is crucial to these physiological and behavioural processes. It is imperative to understand the role of HSF in *Anopheles funestus* as it is important to advance knowledge in order to understand this main African malaria vector.

Supervisor/s: Prof L Koekemoer

BOPAPE, Malebogo Audrey

Physiology

THESIS: Effects of Dietary supplementation with β -sitosterol on Cobb 500 broiler chicken productivity, health and product quality

In commercial poultry production feeds are fortified with growth promoting synthetic antibiotics which pollute the environment, taint poultry products and cause antibiotic resistance. In pursuit of "green and climate-smart" feed supplements, this study demonstrated that β -sitosterol, a natural phytochemical, can replace synthetic antibiotics in broiler chicken feeds as a growth promoting feed supplement without compromising growth performance, meat yield and quality and bird health.

Supervisor/s: Dr E Chivandi, Dr B Lembede and Prof K Erlwanger

CAMPBELL, Lisa

Human Genetics

THESIS: The utility of clinical exome sequencing as a first-tier diagnostic tool in critically ill infants in South Africa. Genetic disorders significantly contribute to infant mortality and morbidity globally; nevertheless, their diagnosis remains challenging. Next Generation Sequencing (NGS)-based testing approaches have proven successful in diagnosing these conditions in infants worldwide; however, previous studies lack representation from low and middle-income countries. This pilot study demonstrated the successful implementation of NGS-based gene panels for the diagnosis and management of ill infants in the South African State healthcare system, achieving a diagnostic yield of 22%, and explored the necessary adaptations from global implementation strategies to address local challenges.

Supervisor/s: Prof A Krause and Dr N Carstens

DOWNS, Sarah Leah

Clinical Microbiology & Infectious Diseases

THESIS: Temporal changes in *Streptococcus pneumoniae* colonization in children following routine childhood immunization with pneumococcal conjugate vaccine in South Africa

This research developed a high-throughput nanofluidic real-time PCR method for detecting 92 pneumococcal serotypes and 15 bacterial species in nasopharyngeal samples, significantly improving serotype-specific analysis. Applied to South African children in rural and urban settings, the study revealed substantial declines in vaccine-type (VT) pneumococcal colonization eight years post-PCV13 introduction. However, VT 19F prevalence persisted, suggesting limitations in current vaccination effects. These findings offer essential insights into serotype dynamics in South Africa, informing future vaccine impact evaluations in similar settings.

Supervisor/s: Dr M Nunes and Prof S Madhi

ENGELBRECHT, Linette

Nursing Education

THESIS: The development of a competency-based programme for management of disease outbreaks
Disease outbreaks significantly impact global health, leading to millions of deaths and straining healthcare systems, particularly in African nations. There is a notable absence of specialised programs aimed at equipping healthcare professionals to effectively manage these outbreaks. This study employed an exploratory sequential mixed-methods approach, grounded in Critical Realism, to create and validate a tailored program for South African nurses. The final curriculum consists of ten modules designed to equip nurses with essential skills and knowledge for effective management of disease outbreaks.

Supervisor/s: Dr L Crous and Dr S Schmollgruber

ESSA, Divesha

Pharmacy and Pharmacology

THESIS: Design of a smart, stealth nano-system for targeted drug delivery in prostate cancer treatment

This research describes the design and development of an antibody-conjugated polymeric Nano-system for receptor targeted delivery of docetaxel for prostate cancer treatment. The work outlined the experimental optimisation of the Nano-system and highlighted its ability to specifically target prostate cancer in 2D and 3D in-vitro models. The results demonstrated the higher efficacy and selectivity of the targeted nano-system compared to the free drug, suggesting its potential for application in targeted prostate cancer therapy.

Supervisor/s: M KaurAspf P Kondiah

GBANDE, Sulleh

Nursing Education

THESIS: A Nurse-led palliative care programme for women receiving palliative chemotherapy for breast cancer in Ghana

The researcher conducted a sequential multi-method study directed in four phases. The purpose was to develop, validate and pilot test a palliative nursing care programme for women receiving palliative chemotherapy for breast cancer in Ghana. The Wilcoxon rank signed-rank test showed that before the intervention severity of pain among patients was high with a mean score $m=9.34$ ($SD\pm 1.04$). However, after the intervention the severity of pain among breast cancer patients reduced, with a low mean score $m=2.75$ ($SD\pm 0.00$), with a significance of $p\text{-value} < 0.05$.

Supervisor/s: Mrs O Obiora

GEEL, Jennifer Ann

Paediatrics and Child Health

THESIS: The feasibility of introducing a harmonised treatment regimen comparing affordable blood tests and PET CT scans to improve two-year survival rates in children, adolescents and young adults with Hodgkin lymphoma in South Africa

This study aimed to improve survival of children and adolescents with classical Hodgkin lymphoma in South Africa through a harmonised treatment guideline. The retrospective component established baseline survival rates and prognostic factors. The prospective phase incorporated all state and most private paediatric oncology units, documenting higher survival with risk-stratified, response-adapted regimens. Machine learning was used to prove that low-cost blood tests could predict chemosensitivity, reducing the need for radiotherapy. Overall survival was markedly improved, especially for patients with HIV.

Supervisor/s: Prof D Ballot and Mr M Metzger

GOVENDER, Melanie Ann

Human Genetics

THESIS: Determining the risk profile for chronic kidney disease (CKD) in rural South Africans using genetic risk scores and protein markers

This thesis investigated genetic risk models for kidney disease and evaluated the proteomic profile of hypertension-associated albuminuria in black South Africans. Polygenic scores developed from different ancestries showed poor predictability in Africans, emphasising the need for large African research cohorts. Urinary proteomic data with a machine learning approach was able to classify disease status and identify proteins and pathways associated with hypertension-associated albuminuria. This research addresses the gap of omics research in resident African populations.

Supervisor/s: Dr J Brandenburg, Dr J Fabian and Prof M Ramsay

GUMEDE, Siphamandla Bonga Ziphozonke

Internal Medicine

THESIS: Strengthening understanding of effective adherence strategies for first-line and second-line antiretroviral therapy(ART) in selected rural and urban communities in South Africa

This thesis assessed the barriers and facilitators to adherence for patients receiving first-line and second-line antiretroviral therapy (ART) and evaluated adherence strategies utilised in rural and urban communities in South Africa. This study adapted the socio-ecological framework to conceptualise the complex interplay of individual-, relationships-, community- and policy-level factors that influence adherence to ART. The evidence presented in this thesis enabled the candidate to make recommendations for comprehensive, and appropriate intervention strategies to improve treatment adherence.

Supervisor/s: Dr S Lalla-Edward

HLABANGANA, Linda Tebogo

Diagnostic Radiology

THESIS: The use of social media platforms in implementing quality improvement initiatives for quality assurance of paediatric chest radiographs in radiological departments of varying radiographer expertise

The research involved detailed quality evaluation of paediatric chest radiographs before and after remote quality improvement interventions, at three geographically separated hospitals, using social media as the quality improvement tool. Although social media have demonstrated an impact in education and communication, the usage by radiographers in South Africa was limited, primarily by network costs. The study highlighted the need for novel interventions to make social networking sites into effective quality assessment and quality intervention tools in paediatric radiography.

Supervisor/s: Mrs I Maré and Prof S Andronikou

HOLLHUMER, Roland

Ophthalmology

THESIS: Ocular surface squamous neoplasia: Risk factors, diagnosis, management and outcomes at a tertiary Eye Hospital in South Africa

This study showed that Ocular Surface Squamous Neoplasia (OSSN) presents in younger patients with an equal gender distribution, when compared to high income countries. HIV was the leading risk factor. The study showed that optical coherence tomography performed the best as a non-invasive diagnostic investigation, followed by liquid-based cytology. The study examined the outcomes of a standardised management algorithm that combined surgery with topical chemotherapy and reported a low recurrence rate of 1.8%.

Supervisor/s: Dr P Michelow and Dr S Williams

IBRAHIM, Ranya Mohammed Mukhtar

Pharmacy and Pharmacology

THESIS: Development of a biocompatible hydrogel platform for wound healing and skin regeneration

This study investigated the potential of secretome derived from rat dermal fibroblast cells, incorporated into an alginate-soy lecithin hydrogel, to accelerate cutaneous wound healing both in vitro and in vivo. The hydrogel exhibited enhanced wound healing capabilities, which were attributed to the sustained release of growth factors and cytokines from the secretome. This resulted in the improved cell-to-cell communication and promoted tissue remodeling. The developed hydrogel showed promise as an effective treatment for cutaneous wounds.

Supervisor/s: Dr H Mndlovu, Dr P Kumar and Dr Y Choonara

JACOBS, Jolandi

Physiotherapy

THESIS: Bowling biomechanics, physical profiles, and injuries among female cricket players

The professional development of women's cricket has created an urgent need for injury prevention and performance research tailored to female players. This thesis addresses this need through four studies focused on female cricket: a comprehensive review of 158 sports science and sports medicine studies, an analysis of physical profiles, an investigation into injury rates, and a comparative study on sex-specific bowling biomechanics. Findings offer critical insights for clinicians and coaches, supporting tailored interventions and guiding future research in women's cricket.

Supervisor/s: Dr B Olivier and Dr C Brandt

KUMALA, Justin

Virology

THESIS: The effect of insecticide resistance on Malaria vector control in Chikwawa, Southern Malawi

Malaria remains a major public health problem in Malawi, with around 6 million cases annually. Insecticides are pivotal in controlling the mosquitoes that transmit the disease, but resistance has increased over the years. This study investigated the impact of insecticide resistance on malaria vector control in Chikwawa, a high-transmission area in southern Malawi. Findings offered an early warning of reduced control efficacy, informing the local vector control policy to prevent program failures and better protect communities from malaria.

Supervisor/s: Prof M Coetsee

LOPES, Tiago Ferrao

Physiology

THESIS: Cognitive, cardiovascular and muscular stress imposed by a Twenty20 batting simulation
Elite sporting performance is not achieved through physical prowess alone; athletes must also generate fast, accurate reactions to stimuli. This thesis pioneers methods for investigating the exercise-cognition interaction in batters during a Twenty20 innings. Results suggest that amateur batters can complete an innings with little decline in physical performance; however, cognitive performance may be compromised at higher run-scoring rates. These findings provide novel coaching paradigms to prepare batters for competition and tools to further research their skills.
Supervisor/s: Dr B Olivier and Miss S Kerr

LUBEYA, Mwansa Ketty

Public Health

THESIS: A mixed-methods analysis of the implementation and uptake of the human papillomavirus vaccination of adolescent girls in Lusaka, Zambia

This thesis explores the Human Papillomavirus (HPV) vaccination of adolescent girls from the perspective of diverse stakeholders in Zambia, specifically examining key factors that influence vaccine implementation by providers and acceptance by adolescent girls. Applying behavioural and implementation science frameworks, the study provides insights into strategies for improving HPV vaccine uptake by addressing socio-cultural, behavioural, and implementation barriers. This work contributes to the broader goal of cervical cancer prevention and serves as a foundation for strategic health interventions to enhance HPV vaccine coverage in Zambia and other low resource settings.

Supervisor/s: Dr M Kawonga

MAKWERO, Martha Thokozani

Public Health

THESIS: The Assessment of Patient-centered Care among diabetic patients in Southern Malawi

This work proposes an operational framework for patient-centred care (PCC), a quality-of-care concept in the context of chronic care medical encounters; ensuring that its functional elements are expressible and measurable through the development and validation of a measurement tool. The study confirms that PCC interactions mediate better patient experiences and outcomes yet its practice among providers especially shared decision-making is low in Malawi. Therefore, the study makes an advocacy case to promote and incentivize PCC in quality appraisal frameworks and medical education.

Supervisor/s: Dr A Muula and Mr J Igumbor

MANJATIKA, Arthur Tsalani

Anatomical Sciences

THESIS: Examination of the metatarsal diaphyseal nutrient foramina: implications for forensic analysis and morpho-functional adaptations in 19th and 20th century individuals

The role of metatarsal nutrient foramina (NF) in both clinical fracture development and management, as well as for human identification in forensic settings, was previously unclear. NF are small openings for blood vessels through bones. Using skeletal remains from the three major South African population groups, this thesis provides a comprehensive description of the topographical, morphological and trabecular microstructural variations around the NF and also demonstrates that the metatarsal NFs are applicable for forensic sex estimation in South Africans.

Supervisor/s: Dr J Davimes and Dr P Mazenganya

MAPUNDU, Michael Tonderai

Public Health

THESIS: Computational approaches to characterizing morbidity and mortality patterns in rural South Africa

This thesis explores computational techniques in analysing large-scale verbal autopsy (VA) data to characterise morbidity and mortality patterns. By leveraging machine learning (ML) and deep learning (DL), it accurately identifies prevalent diseases, mortality trends, and health disparities, providing insights into risk factors and socio-economic correlations. The study emphasises the integration of these models into the cause-of-death pipeline with human annotation, reducing VA processes, diagnosis turnaround times, and costs. Additionally, the intrinsic lack of model transparency is addressed, fostering trust and enhancing the acceptance of machine diagnoses in public health strategies.

Supervisor/s: T Celik, Dr C Kabudula and Mr E Musenge

MASEKO, Lebogang Johanna

Occupational Therapy

THESIS: Integrating rehabilitation services at primary healthcare level in Johannesburg, South Africa
This study evaluated the integration of rehabilitation into South Africa's primary health care (PHC) to advance universal health coverage. Using a multi-phase, mixed-methods approach, it highlighted integration challenges in low- and middle-income settings. Although service delivery shows adaptations, full integration remains limited due to inefficient referrals, resource constraints, and inconsistent policy application. Nevertheless, proactive rehabilitation staff, strong interprofessional collaboration, and a multidisciplinary approach suggest potential for a more cohesive model. The study proposes a patient-centred PHC rehabilitation framework emphasizing governance, teamwork, and community empowerment to enhance accessibility and accountability.
Supervisor/s: Dr F Adams and Dr H Myezwa

MATUVHUNYE, Takudzwa *Clinical Microbiology and Infectious Diseases*
THESIS: Molecular characterisation of Group B Streptococcus (GBS) and its association with vaginal microbiome among pregnant women from low-middle income countries
The study investigated the genetic diversity of Group B streptococcus (GBS) in pregnant women from six sub-Saharan African and two Southeast Asian countries. The results showed differences in the prevalence of sequence types and clonal complexes between regions, with the hypervirulent GBS adhesin being prevalent in African region but absent in Southeast Asia countries. Analysis of the vaginal microbiome suggest that interventions targeting the vaginal microbiome could reduce the risk of invasive GBS disease in pregnant women and their newborns.
Supervisor/s: Dr G Kwatra and Prof S Madhi

MBARUSHIMANA, Valens *Public Health*
THESIS: Early adolescents' knowledge, beliefs and behaviors regarding gender and sexuality in Rwanda: implications for their sexual experiences and health outcomes
This thesis explores how early adolescents (12-14 years) in Rwanda acquire knowledge and attitudes to promote their sexual and reproductive health and rights (SRHR). It further investigates the context and the association between this knowledge, sexual experiences and health outcomes. Early adolescents are minimally represented in policies, are taught little about recommended topics, have low SRHR knowledge, and yet they have started engaging in friendship and sexual experiences. Promoting early adolescents' sexual health requires considering all aspects of their environment.
Supervisor/s: Dr S Goldstein and Ms D Conco

MLANDU, Chenai *Public Health*
THESIS: Maternal, newborn and child healthcare services utilisation in three sub-Saharan African countries (DRC, Kenya and Tanzania) using Demographic Health Surveys data from 2007-2016: Application of Generalised Structural Equation and Machine Learning Models
Maternal, newborn, and child healthcare (MNCH) is key in improving neonatal survival. The study assessed the utilisation of MNCH services and associations with neonatal mortality using Generalised Structural Equation and Machine Learning models in the DRC, Kenya and Tanzania. Antenatal, delivery and postnatal care uptake was suboptimal, inequitable and linked with neonatal mortality. Machine Learning models demonstrated high prediction accuracy of uptake of these services. Interventions like health financing, improved service delivery and mass media investments could enhance MNCH uptake, with Machine Learning application potentially improving intervention design.
Supervisor/s: Dr Z Matsena Zingoni and Mr E Musenge

MNQIWU, Khumblani *Material Science*
THESIS: Design, synthesis, and bioactivity of hydroxybenzoic acid derivatives and their polymer nanocomposites
The study explores the potential antimicrobial and anticancer properties of these designed compounds through computational modelling and experimental validation. Particularly, the research highlights the variation between in-silico predictions and experimental results, emphasising the critical importance of empirical testing. Additionally, the work investigates the use of polymer nanoparticles as a drug delivery system, demonstrating that loading the synthesised compounds onto nanoparticles significantly enhances their efficacy.
Supervisor/s: Dr M Patel and Dr S Moeno

MOODLEY, Mishalan *Haematology and Molecular Medicine*

THESIS: Integrated methylome and transcriptome analysis of esophageal squamous cell carcinoma in the South African cohort

Esophageal squamous cell carcinoma (ESCC) is a highly prevalent and deadly cancer in South Africa. This study investigated DNA methylation and gene expression changes in Black South African ESCC patients. We discovered significant DNA methylation alterations that aligned with changes in gene expression for key genes: KRT13, Cdc42EP3, TNC, and COL6A3, involved in extracellular matrix (ECM) remodelling. These epigenetic changes may contribute to tumour invasion and metastasis. Our findings underscore the potential of targeting ECM pathways for novel ESCC therapies.

Supervisor/s: Dr P Willem and Prof C Mathew

MOOSA, Fahima

Clinical Microbiology and Infectious Diseases

THESIS: Prevalence and molecular epidemiology of Bordetella pertussis infection in South Africa

Pertussis remains a public health concern in South Africa, evidenced by rising case numbers and outbreaks in recent years. This study focused on describing the incidence, transmission dynamics, serological attack rates, and molecular epidemiology of Bordetella pertussis in South Africa from 2015 to 2019. The study outcomes highlight that the increase in cases is unlikely attributed to genetic changes in the pathogen but rather suggests declining population immunity following routine use of acellular vaccines or gaps in population immunity as potential causes.

Supervisor/s: Dr A Von Gottberg, Dr M Du Plessis and Mrs N Wolter

MOSHOETTE, Tumelo

Haematology and Molecular Medicine

THESIS: Engineering bispecific antibodies targeting HIV-1 subtype C

In this thesis, the researcher describes the engineering of two novel bispecific antibodies that comprise of a host-targeting antibody, ibalizumab, and the anti-HIV-1 antibodies CAP256 and N6. The resultant bispecific antibodies, iMab-CAP256 and iMab-N6 exhibited increased neutralisation coverage against HIV-1 in comparison to their parental antibodies with iMab-CAP256 exhibiting enhanced potency. Moreover, iMab-CAP256 compared favourably to previously published bispecific antibodies, 10E08-iMab and PG9-iMab. Subject to further preclinical development, these bispecific antibodies are ideal candidates for developing immunotherapy and immunoprophylaxis strategies against HIV-1.

Supervisor/s: Prof M Papathanasopoulos and Dr M Killick

MUHAYIMANA, Alice

Nursing Education

THESIS: Development of strategies for Health Care Providers to sustain respectful maternity care to women in labour

Respectful Maternity Care (RMC) is a fundamental human right. This Thesis points to development of strategies to sustain RMC. Advancing the scientific discourse with evidence to promote a global culture of RMC. Using an Appreciative Inquiry method, positive childbirth experiences of women and best practices of healthcare providers, emerged. A mixed methods approach, expert national and international reviews, led to predictors of elevated RMC for strategy development. The end product inform how standardised RMC practices for Rwanda can be defined in the broader health system and integrated collaboratively by the relevant stakeholders.

Supervisor/s: Mrs I Kearns

MURTALA, Muhammad Dandare

THESIS: Effect of Haloperidol on stress hormones and quality of sleep in Intensive Care Unit patients with delirium
ICU patients often face challenges related to delirium and sleep. This study evaluated the effect of haloperidol on managing acute stress in ICU patients, specifically its impact on sleep quality, cortisol, and melatonin levels. Both hormones were reduced in the haloperidol treated group compared to the untreated group, with sleep quality adversely affected. A validated HPLC method was developed to monitor plasma levels of haloperidol and tramadol. Alternative treatment to haloperidol is needed to optimise care of ICU patients with acute stress.

Supervisor/s: Dr A Van Eyk Dr S Schmolgruber

MWANGALA, Patrick Nzivo

Public Health

THESIS: Ageing with HIV: Psychological wellbeing and its biopsychosocial determinants at the Kenyan coast

The ageing of the HIV population has created a subgroup of vulnerable older adults living with HIV, thus demanding a prompt response in research, policy, and practice. This thesis examined the psychological and functional wellbeing of these adults in a low-literacy Kenyan setting using a mixed methods study. Findings suggest that these adults are at risk of mental ill-health, frailty and cognitive impairments in selected domains. Many of the observed determinants of these outcomes are psychosocial factors and potentially modifiable.

Supervisor/s: Dr R Wagner and Prof C Newton

NEOPHYTOU, Natalia

Therapeutic Sciences

THESIS: A model of care which includes motor proficiency and physical activity levels for children with Autism Spectrum Disorder

This thesis developed a comprehensive model of care for children with autism spectrum disorder (ASD). The model provides a novel framework for addressing physical inactivity and reduced motor proficiency and emphasizes the need to integrate motor-related aspects into standard ASD care. The model identifies key stakeholders who should be involved in the process, and highlights the need for multidisciplinary, and individualised management. The model includes guidance regarding appropriate education and awareness, individualised assessment, integrated feedback, intervention development and efficacy monitoring relating to the motor skill profiles of children on the spectrum.

Supervisor/s: Dr G Torres

NEVONDWE, Patracia Livhuhani

Human Genetics

THESIS: Designing and evaluating the utility of a panel of de novo mutation (DNM) enriched genes for diagnosing South African patients with developmental delay

Developmental disorders are diverse and life-altering conditions, with approximately half having a genetic basis. However, many patients remain undiagnosed due to limitations in current testing methods, resulting in significant health burdens in resource-constrained settings, such as the South African State healthcare system. This thesis presents a cost-effective screening approach that employs a panel of de novo mutation-enriched genes, offering a practical solution for diagnosing developmental disorders. This approach serves as a starting point for developing cost-effective diagnostic strategies in resource-constrained settings, ultimately enhancing patient outcomes.

Supervisor/s: Dr N Carstens and Prof A Krause

OLADEJO, Temitope Seun

Physiotherapy

THESIS: HIV-related disability: development of a contextualised physical activity program

The study explored the interplay between disability, health perceptions and physical activity among people living with HIV (PLWH) in Nigeria using a mixed-methods research design. The majority of participants did not meet WHO-recommended physical activity guidelines and barriers included fatigue, lack of time and an unsupportive environment. This study aimed to bridge these gaps. Through scoping reviews, interviews of PLWH and an expert panel, an intervention program was developed to empower PLWH to engage in regular physical activity.

Supervisor/s: Dr A Ajidahun, Dr H Myezwa and Dr S Ibeneme

PADARATH, Kiyasha

Internal Medicine

THESIS: Comparison of the proteome of Huh-7 cells transfected with different (sub)genotypes of Hepatitis B Virus prevailing in sub-Saharan Africa

Hepatitis B virus prevails in sub-Saharan Africa and is a major cause of liver cancer. For the first time, the study showed that African strains of HBV can affect protein expression of liver cells in tissue culture. The disturbance of pathways by the virus can play a role in the development of liver cancer.

Supervisor/s: Dr A Deroubaix and Prof A Kramvis

PHAKOAGO, Makabudi Valery

Physiology

THESIS: Myrmecophagous mammals in a changing world: the ecology of aardvarks and Temminck's pangolins in the Kalahari

Many mammals are facing increasing heat loads together with reduced water and food availability as a result of climate change. The candidate explored the physiological ecology of the aardvark and the ground pangolin, two elusive species that we know very little about, by investigating how their diet, food availability and behaviour change with changes in the climate. This thesis has provided crucial information on how these mammals will cope in a changing world, and how best to conserve them.

Supervisor/s: Dr A Fuller and Prof S Maloney

SEKOME, Kganetso

Public Health

THESIS: Feasibility and acceptability of a contextualized physical activity and diet intervention for hypertension control in a rural adult population of South Africa

Adults in rural South African settings have high levels of uncontrolled hypertension. This thesis sought to develop, implement and assess the feasibility and acceptability of an intervention to adjust routine physical activity and diet for hypertension control in adults aged 40 years and over. 100% of targeted participants were recruited, 93% were retained and 93% provided complete data. The intervention presented high levels of feasibility, acceptability, and fidelity with all four measures of fidelity showing that the intervention was delivered as planned.

Supervisor/s: Dr F Gomez-Olive Casas and Dr H Myezwa

SHABAN, Siham Ibrahim Ahmad

Clinical Microbiology and Infectious Diseases

THESIS: Antifungal activity of synthetic peptides targeting apoptosis in candida auris

This thesis investigated the therapeutic potential of antimicrobial peptides (AMPs) as a novel approach to combat the multidrug-resistant pathogen *Candida auris*. *C. auris* is an emerging global healthcare threat, particularly among immunocompromised individuals. This study demonstrated the effectiveness of AMPs against *C. auris* by targeting multiple mechanisms, including membrane disruption, apoptosis induction, inhibition of virulence factors and efflux pumps and synergized with conventional antifungals. These findings highlight AMPs as promising candidates for developing novel therapeutic agents against *C. auris* infections.

Supervisor/s: Dr A Ahmad and Dr M Patel

SIMAMANE, Mandisa Jewel

Biokinetics

THESIS: Physical activity intervention plan for hypertensive patients of Umlazi township, KwaZulu-Natal

The global rise in hypertension, driven by aging, sedentary lifestyles, and obesity, increases cardiovascular risks. The study investigated the implementation of a physical activity intervention plan, coupled with family member involvement within the primary healthcare sector, would contribute to the effective management of hypertension among hypertensive patients residing in the community of Umlazi township, KwaZulu-Natal. The findings reaffirm the synergy of pharmacological and lifestyle interventions, advocating for clinical integration of physical activity and family support in hypertension management.

Supervisor/s:

SINGH, Ashmika

Virology

THESIS: Characterisation of the dynamic gut microbiota of members of the *Anopheles gambiae* complex

Malaria is transmitted by *Anopheles* mosquitoes, which are increasingly challenging to control through conventional insecticide-based methods. Therefore, alternative control methods are necessary. Ideally, these should avoid chemical interventions. The gut microbiota of mosquitoes plays a crucial role in shaping their life history, making microbiome manipulation a promising biocontrol strategy. This study characterised the gut microbiome of the *Anopheles gambiae* complex, along with examining how changes in the larval environment, through exposure to heavy metals and salt, impact the adult gut microbiota.

Supervisor/s: Dr S Oliver

SMITH, Tiffany Shenay

Haematology and Molecular Medicine

THESIS: Inactivating hepatitis B virus replication using obligate heterodimeric TALEN-encoding mRNA

The study explored a novel approach to treating chronic hepatitis B virus (HBV) infection. Each year, this infection causes over 1 million deaths because current vaccines and treatments do not effectively counter the virus. Research reported in the thesis focused on using mRNA to encode engineered gene editors, called TALENs, that disable HBV permanently. Preclinical evaluation showed significantly reduced viral replication without harmful side effects. The study marks the first successful use of TALEN-encoding mRNA to inactivate HBV.

Supervisor/s: Dr A Ely and Prof P Arbutnot

STAMP, Gabriella Elisabeth

Physiology

THESIS: The association between adult attachment style and pain perception in a South African cohort

This thesis involved two studies that aimed to investigate the complex association between adult attachment style and pain in a South African population. The large nationwide survey found that insecure (compared to secure) attachment styles were associated with higher chronic pain prevalence. However, it found no association between attachment style and pain perception in the second study using a controlled experimental setting, suggesting complex factors at play in chronic pain that may not be replicable in controlled experiments.

Supervisor/s: Miss S Iacovides and Mrs A Wadley

SUBRAMONEY, Kathleen

Virology

THESIS: Molecular epidemiology and characteristics of immune adaptations across the SARS-CoV-2 spike glycoproteins from Gauteng, South Africa, 2020 to 2022

This study described and analysed lineages during 2020 to 2022 among 2381 SARS-CoV-2 genomes sequenced. Despite dominance of variants of concern, other lineages with continued circulation at lower frequencies harboured similar mutations of significance. Heterogeneous infections detected in 9% of individuals may explain the diverse SARS-CoV-2 lineages; and contribute to the virus's ability to rapidly evolve and escape neutralising antibodies. A novel spike construct, wherein cytotoxic T cell epitopes were maximised through accounting for SARS-CoV-2 diversity, was successfully generated.

Supervisor/s: Dr F Treurnicht and Prof B Fielding

TOMMY, Kimberleigh Ashley

Anatomical Sciences

THESIS: A comparative study of trabecular structure of the patellofemoral joint: Evolutionary and Biomechanical perspectives

This thesis analysed trabecular bone structure of several primate patellofemoral joints using high-resolution MicroCT scans. Significant differences in structure among extant primates and fossil hominins were found, likely stemming from species-specific locomotor behaviours. In humans, variations in trabecular structure were associated with different activity levels and degrees of osteoarthritis. The results highlight the complexity of knee joint loading and emphasise the need for further studies to better understand primate knee biomechanics.

Supervisor/s: L Schepartz, Dr B Zipfel and Dr K Carlson

WAGNER, Fezile Sthembile

Public Health

THESIS: A nexus of student food (in)security, common mental disorders, and academic success in the midst of the COVID-19 pandemic

This thesis investigates the impact of COVID-19 on food insecurity and mental distress among first-year students at a large urban South African university, using a mixed methods research design. Results show that, despite lower failure rates, dropout rates increased during the pandemic. While food security improved, mental distress also rose. The study links heightened dropout rates to food insecurity and mental distress, emphasising the critical need for psycho-social support in higher education, especially in times of disruption.

Supervisor/s: Dr F Gomez-Olive Casas

WEINBERG, Micaela Darielle

Physiotherapy

THESIS: An assessment framework of the shoulder girdle in participants with temporomandibular disorders

A rise in prevalence and chronicity of temporomandibular disorders motivated the need for an expansion in the knowledge on other connecting areas of the temporomandibular joint, such as the shoulder girdle. This thesis consisted of four phases to achieve a consensus on an assessment framework of the shoulder girdle in participants with temporomandibular disorders. It provided an in-depth assessment of the connections between the temporomandibular joint and shoulder girdle expanding the current body of evidence of these two areas.

Supervisor/s: Dr B Olivier and Mr S Kunene

FACULTY OF HUMANITIES

DEAN: PROFESSOR M MUSEMWA BA Hons (Zimbabwe) MA (Cape Town) PhD (Minnesota, USA) MASSAf

Doctor of Philosophy

ADENIJI, Kehinde Adedayo

Education

THESIS: Towards improving rural learners' mathematics achievement: The roles of social relationships and identities

The thesis titled "Towards improving rural learners' mathematics achievement: The roles of social relationships and identities" substantially contributes to and fills key research gap in the field of mathematics education, more especially in the rural context. The contributions are foregrounded with the originality, philosophical engagements, theoretical insights and methodological rigour of the study. The study also goes beyond all these sophistications to translate them to a practical teaching practices for mathematics teachers.

Supervisor/s: Dr A Essien

ANYANZU, Francis

Demography and Population Studies

THESIS: The Role of Social Networks in Destination Selection Among Urban Refugees in Kampala, Uganda

Using a mixed method, the thesis investigated the social networks of the urban refugees in Kampala and how they influence the refugees to specifically move to Kampala. The study contributes to urban refugee literature by identifying the critical social network actors and how the social support exchanged through interrelationships in the social influenced the refugees' settlement decisions.

Supervisor/s: Dr N De Wet

ARMSTRONG, Doug Connolly

Music

THESIS: MUCUS (Music Composition User System) Infectious Flexible Creative Interaction with An Algorithmic Music Composing Application

Douglas Armstrong's research investigates human-computer collaboration in music creation through the design of an interactive algorithmic music composing tool that fulfils the role of a creative collaborator. The potential for such interaction is harnessed by using high-level musical descriptors and capturing user sentiment to build a model of the user's musical preferences. The results of this study offer insights into the value of rule-based algorithms in light of current discourse concerning the development of AI in the creative arts.

Supervisor/s: Mr J Crossley and Dr C Harris

ARNOLD, Laura Jane

Education

THESIS: Exploring fourth-year Sol Plaatje university student teachers' professional identities development during teaching practice

This study explored 4th year SPU student teachers' construction and awareness of developing professional identities during teaching practice. Relational and collegial professional identities were developed through reflections on prior teaching and learning experiences. They were influenced by personal, social, and temporal conditions that need to be seriously considered in ITE Programs

Supervisor/s: Dr T Nkambule

BOBAT, Safiya

Psychology

THESIS: Narratives of identity and belonging: place and the everyday practices of immigrant Muslim women living in Fordsburg, Johannesburg

Dr Bobat's thesis explores the ways in which identity is negotiated across place and time, through everyday food practices. Narrative interviews were conducted with 10 immigrant Muslim women from India, Bangladesh and the Philippines, living in Fordsburg or "Foodsburg", Johannesburg. Food evokes nostalgic memory and loss, but also is also utilised to craft new relational forms of belonging and being at home. The examiners described Bobat's narrative analysis as "rich and fascinating to read, nuanced and sensitive" and highly original

Supervisor/s: Dr J Vearey and Prof J Bradbury

BUSIKA, Nonkululeko Faith Noluthando

Drama

THESIS: The search for 'Ichambawilo' (an encounter) with refugee and asylum-seeker parents whose children are vulnerable: an African Drama therapy intervention programme.

This thesis focuses on a designed and implemented African Drama Therapy intervention program for parents of children participating in the Three2Six project in Johannesburg, receiving drama therapy. The designed drama therapy intervention program is intended to assist this community of parents in adequately fulfilling their parental responsibilities in a socio-economically challenging environment in South Africa. The API-R5 intervention is based on concepts of Ubuntu and Spirituality central to African well-being

Supervisor/s: Ms P Gerrand

COETZEE, Anton Stephen

History of Art

THESIS: THINGS IN FLUX : Understanding the ontological dynamics of digital heritage objects

Dr Anton Coetzee has immersed himself in the field of digital heritage to offer a critique of data-driven mass digitization. He interrogates the 'black-boxing' of digitization procedures through focused studies of two specific things - a pair of engraved cow horns housed in a museum, and a rock-shelter with San rock painting and graffiti - and makes the case for 'slow digitization' as thoughtful object-centric practice, fully engaged with the effects, sometimes violent, of things as they shift between worlds

Supervisor/s: Dr J Wintjes

CUSTER, Scott

International Relations

THESIS: The Evolution of Peace Enforcement: United Nations Enforcement Actions Under Article 42 of Chapter VII
This thesis provides a comprehensive examination of the evolution of peace enforcement operations. The research explores the changing actor constellations in peace enforcement, the conditions under which peace enforcement operations are initiated, and the strategic considerations that guide the international community's response to threats to peace and security.

Supervisor/s: Dr M Brosig

EMUPENNE, Olanrewaju Ojo

International Relations

THESIS: The Geopolitics of Climate Change and Violent Conflicts in Africa: The Nigerian and Kenyan Perspectives
This study explores the linkages between climate change and violent conflicts in Africa, specifically farmer-herder conflicts in the Kenya (Tana River County) and Nigeria (Middle Belt Region). Existing inter-communal conflicts have intensified due to drought, desertification, the scarcity of water and arable land, and migration. The study employs a mixed method research design utilizing questionnaires and interviews, document and policy analysis, to provide empirical data on the domino effects of climate change on violent conflict in these two cases.

Supervisor/s: Miss M Small

GAMEDZE, Asher Simiso

History

THESIS: Ensemble study and struggle: A history of the Yu Chi Chan Club and the National Liberation Front.

This innovative thesis examines the history of the relationship between study and struggle of the Yu Chi Chan Club and the National Liberation Front, their predecessors and afterlives. It presents original research on a black, independent socialist tradition of national liberation politics, its changing ideas and activities in the struggle against apartheid and racial capitalism. The examiners lauded this work as 'a stunning thesis' and 'deeply researched, richly detailed [and] written with clarity and care'.

Supervisor/s: Dr M Nieftagodien

HENDRICKS, Sumaya

Education

THESIS: Internships & intentions: A grounded theory study of a South African government graduate internship programme

This study used a grounded theory approach to understand the factors which affected intern learning on a graduate internship programme run by the South African government. The central phenomenon and theoretical contribution the study makes is in identifying, describing and theorising the rupture between the intended curriculum and the curriculum as experienced by interns. This rupture is characterised as a metaphorical curricular fission creating a situation hindering interns from becoming full workplace participants.

Supervisor/s: Dr L Hewlett and V Wedekind

HOOPEN, Leyya

Anthropology

THESIS: Masjid Al-Nasaa: Women Call for an Islamic Elsewhere

This thesis explores the meanings of being a 'Muslim woman' in South Africa in the context of the digitisation that marked the Covid-19 pandemic. It centres the research participants' call to Islam(s). The seven core theoretical and narrative chapters are framed by Islamic cosmologies as an epistemic space.

Supervisor/s: Dr Z Erasmus and Dr M Wilhelm-Solomon

HORSTHEMKE, Fiona Ramsay

Drama

THESIS: Navigating Liminal Space: Embodied Knowledge and Performance Pedagogies in Archival Reconstruction

This creative research project examines emergent decolonial practice and pedagogical methodologies by revisiting and reconstructing four theatre productions from an archive of work produced in South Africa during the apartheid period. Through this process, entangled histories are deconstructed and shared, and liminal spaces are identified in the preparation and performance processes as critical for facilitating awareness and engagement with the complexities of inclusive curricula.

Supervisor/s: Dr D Andrew and Dr S Ravengai

JEONG, Da Un

Development Studies

THESIS: A study of Saemaul Undong in South Korea: Making self, memory and development

Da Un Jeong's remarkable study of South Korea's Saemaul Undong (New Village Movement) crosses the boundaries of development studies, oral history and cultural sociology. It draws on a range of sources - from life histories to state archives' to show how state-development projects do not simply work at the level of the state. Moving away from top-down studies of development and governance, it shows how such projects play out at the micro-level of the self. This thesis powerfully contributes to the fields of development, social movements and state-building in the global South.

Supervisor/s: Prof S Roy

JONES, Dilys Margaret

Speech-Language Pathology

THESIS: Factors influencing listener comprehension in multicultural dysarthria.

In line with contemporary approaches, this study aimed to identify barriers and facilitators of comprehension in dysarthria (a neurological speech disorder) in a multicultural context. The results showed that comprehension of the relatively unintelligible speech of speakers with dysarthria is affected by a number of listener variables, including home language and experience. The results also suggested that listener training is effective in improving comprehension of dysarthric speech

and should be incorporated into intervention for dysarthria.

Supervisor/s: Dr H Jordaan

JONGWE, Tapfuma Ronald

Education

THESIS: School heads' experiences and perspectives on critical leadership competencies in Zimbabwe: A phenomenological study

The study examined the lived experiences of Zimbabwean school heads to identify key competencies for effective leadership. It employed a qualitative, phenomenological approach, involving interviews and diary entries from six leaders. The findings revealed essential competencies grounded in transformational and instructional leadership theories, as well as five enabling factors that support effective leadership and improved student learning. The insights provide valuable guidance for enhancing the development and training of school leaders in Zimbabwe.

Supervisor/s: Dr P Mthembu

KHUZWAYO, Zuziwe

Sociology

THESIS: Bisexuality in Democratic South Africa: Experiences of Women in Johannesburg

This thesis centers the experiences of bisexual women, at the intersections of race, class, age and space in Johannesburg. Drawing on in-depth interviews, this study shows the everyday unfolding of women's sexuality in a democracy where LGBTQI+ rights exist but have not been fully realised. Amidst violence and invisibility, queer women carve a space for themselves in the city, push against heterosexual norms and even the lack of recognition in LGBTQI+ spaces. It richly contributes to sexuality studies in the Global South.

Supervisor/s: Prof S Roy

LETSWALO, Morokoe Gabriel

Sociology

THESIS: Ethics and the Destiny of Being
(a parable)

In this maverick and magisterial thesis that a reviewer called "brilliant, thoughtful, and courageous," Gabriel Morokoe Letswalo proposes the Redemption of the dead - by way of a black 'parable' on self, human, and animal sacrifice - as a form of realising human Destiny, as a condition of overcoming the misfortune of finitude.
Supervisor/s: Dr S Ally and Prof E Worby

MACFARLANE, Marco Vincenzo William

Psychology

THESIS: Core Academic Language Skills in Grade 6 South African Learners

This research validates a construct that describes cross-disciplinary Core Academic Language Skills (CALs). Academic language is crucial for success in school and academic settings, and South Africa faces particular challenges due to the overwhelming dominance of English in our schooling system, despite the linguistic diversity of our population. The CALS construct predicts cross-curricular academic performance, irrespective of first or second-language English status, and provides a basis for explicit instruction in the language forms and functions required for success in schooling

Supervisor/s: Dr L Dison and A Kern

MADHUHA, Edmond

Health Sociology

THESIS: The Persistent Health Burden: Understanding Black South African Working-Class Men's Experiences of Living with Tuberculosis

The thesis explores how tuberculosis (TB) is a disease of sociability in South Africa using decolonial, African centred theories of masculinity. It reveals that TB transmission among men is linked to norms of sharing in closed environments where alcohol use and smoking, combined with poor nutritional behaviour and poverty, create a gendered health crisis. A gendered sociological analysis must inform efforts to fight the disease.

Supervisor/s: Ms L Nunez Carrasco

MAHARAJH, Reshma Navnit

Fine Art

THESIS: Seeming, Being and Becoming: An Intimate, Autoethnographic Rasa-Led performance art exploration

This PhD by Creative Work explores the concepts of "Seeming," "Being," and "Becoming" through the lens of South African Indianness, utilising performance art and the Indian aesthetic theory of Rasa. It examines personal experiences through autoethnography, identity formation, and practice-led research, exploring the possible therapeutic benefits of art, culminating in a Transcendental Emotional Moment that fosters insights, critical reflection and human flourishing

Supervisor/s: Dr D Andrew, Ms S Khan and Prof A Munroe

MAKONGOZA, Matamela Fulufhelo Beatrice

Psychology

THESIS: Young women's accounts of intimate partner violence in cohabiting relationships in Vhembe District, Limpopo Province

This thesis explored young women's accounts of intimate partner violence in cohabiting relationships across the Vhembe District, Limpopo Province. African psychology and feminist approaches in dialogue with Vygotsky's cultural-historical activity theory (CHAT) frameworks were used to examine intimate partner violence within cohabitating relationships in a cultural context that denounces cohabitation thereby rendering young women more vulnerable to possible gender-based violence.

Supervisor/s: Ms P Kiguwa and Ms G Mayisela

MALABELA, Musawenkosi Hemelton

Sociology

THESIS: The crisis of trade union representation in post-1973 unions and the role of the full-time shop steward (FTSS): A case study of NUMSA at BMW Rosslyn Plant

This study uses interviews, document analysis, focus groups, and ethnography to examine the role of Full-Time Shop Stewards (FTSS) at BMW, South Africa. Findings reveal FTSS's potential to strengthen grassroots trade unions and enable upward social mobility while highlighting possible risks. The study contends that FTSS may become tools of management if mismanaged but can prevent despotic tendencies within unions by balancing demands from workers, employers, and unions.

Supervisor/s: Dr S Mosoetsa

MANGO, Thabiso

Psychology

THESIS: Developing a management framework for predicting adherence to HIV care and treatment in Eswatini
The research introduces a conceptual management framework for predicting adherence to HIV care and treatment before initiation, which expands upon the established Theory of Planned Behaviour (TPB) model. The framework enhances the original TPB model by integrating four critical components: a refined behavioural intention, developmental challenges, subjective confirmation of behavioural action, and behavioural validation. By incorporating these elements, the model is rendered pertinent and effective in informing interventions designed to promote adherence to HIV care and treatment in developing countries.

Supervisor/s: Dr M Hara and Ms M Mulaudzi

MAPOSA, Aretha Mwana

Education

THESIS: Education officials' leadership and management practices that create a conducive environment for rehabilitation of learners in a juvenile correctional centre in South Africa

This thesis explores the role of educational leadership and management in juvenile correctional institutions, highlighting the transformative potential of restorative justice principles in rehabilitation. By examining the practices of education officials, the research offers valuable insights into creating a supportive environment that fosters the holistic development of incarcerated youth. The study culminates in the development of the innovative JUmbrella Framework for Educators (JUFE), a culturally responsive model designed to promote positive change within the South African juvenile justice system.

Supervisor/s: Mrs G Motilal

MATANHIRE, Vimbayi

Education

THESIS: Inclusive education and the plight of children without legal documentation: A case study of Cosmo Oasis in Johannesburg, South Africa

The research in the PhD thesis of Matanhire focuses on the crucial area of undocumented children's experiences, from an inclusive education perspective. Using the Cosmo Oasis as a case study, Matanhire notes that had it not been for the services provided by Cosmo Oasis many children who are undocumented, and who include South African children, would not have received any access to basic education. Matanhire's PhD adds to the body of knowledge which highlights the importance of ensuring that all children have access to education.

Supervisor/s: Dr N Carrim

MHLONGO, Siyabonga Thandazani

Education

THESIS: Teachers' perceptions of the use of technology in mathematics classrooms and how it relates to learner motivation: an explanatory sequential mixed methods study

The research explores the impact of digital technology on learner motivation in mathematics within Gauteng's public education system. Using a mixed methods design, it found that teachers generally view technology positively for enhancing motivation. Quantitative data from 23 valid survey responses and qualitative insights from six interviews revealed the complex dynamics of technology use in classrooms. The study underscores the importance of teachers' proficiency in navigating technology to boost motivation and align with South Africa's educational goals.

Supervisor/s: Dr R Dlamini and Dr S Khoza

MNGUNI, Thamba Isaack

Film and Television

THESIS: Analyzing Financial Survival Strategies for Public Service Broadcasters in Disruptive Environments: A Case Study of SABC and Alternative Funding Models

Public broadcasters are the only form of media that are considered to have a constitutionalised public service mandate. Despite this, the question of these institutions' financial survival has been a relentless thorn for many countries given the rise of citizens' refusal to pay television licences. Mnguni's research situates itself between the critical conundrum for free public access to information and the budgetary barriers which make this a herculean task. If freedom is not free, then who must pay and how?

Supervisor/s: Dr Y Koba

MONGAE, Mmabatho

International Relations

THESIS: Governance quality and popular support for democracy in Africa

The support of citizens is crucial to the resilience of Africa's democracies. This thesis uses sophisticated statistical methods to show that public support for democracy across Africa depends on the quality of governance - not just the instrumental delivery of economic benefits but also the political freedoms and protections intrinsic to democracy.

Supervisor/s: Prof R Alence

MOREETSI-MAGETSE, Tebogo Angela

Education

THESIS: Exploring the use of Information and Communication Technology (ICT) in Open and Distance Learning (ODL): The case study of Botswana Open University (BOU)

The study explored the use of Information and Communication Technology in Open and Distance Learning at Botswana Open University. Through an interpretive paradigm, this qualitative case study made use of semi-structured interviews, open-ended questionnaires, and a policy document review to unpack the challenges faced by the students who are registered in an online programme. The study revealed that although there are measures in place to support and assist students during their studies, such measures do not work for all students.
Supervisor/s: Dr S Khoza and Mr V Naiker

MPHOLLE, Reitumetse Vanessa

Media Studies

THESIS: BehindTheGram: A Study Into Instagram Influencers, the Digital Media Economy, and Creative Work in South Africa

This thesis reports on in-depth qualitative research into the labour of social media "influencers" in South Africa, making key contributions to theories of labour and communication praxis. It is a timely focus on a rapidly expanding area of labour in the media and creative industries: self-driven influencer work, which is arguably both redefining and extending the traditional formations of the media economy and the job market in South Africa.
Supervisor/s: Dr M Iqani

MUPFAWA, Shungu

Education

THESIS: An analysis of teachers' discourse when teaching basic genetics concepts in South African classrooms
Shungu Mupfawa investigated the classroom discourse of four life-sciences teachers teaching genetics to grade 12 learners. Drawing from discourse analysis and communicative approaches literature, she analysed detailed transcripts of video recordings of the teachers' lessons. The analysis identified two types of discourse' conceptual and assessment focused. These formed the centre of her Discourse Teaching Strategy Model which revealed that amongst other characteristics, conceptually focused teachers used higher order questions to build conceptual understanding and logical exposition for consolidation.

Supervisor/s: Dr K Padayachee and Prof M Rollnick

MURADZIKWA, Tracey Chipo

Political Studies

THESIS: Women, State Law, and the Crisis of Chieftaincy: the case of Nswazi Village in Zimbabwe
Dr Muradzikwa conducted a feminist ethnography of Chief Sinqobile Mabhena of Nswazi village in Zimbabwe, to establish how the governance strategies of women chiefs are configured in practice. Drawing on fieldwork and narrative analysis, the research shows how African women play a significant role in the reconceptualization of legitimacy in traditional leadership, thus putting to question the naturalization of male chieftaincy primogeniture.
Supervisor/s: Dr S Dube

MUSINAMWANA, Earnest

Development Studies

THESIS: Rethinking Agricultural Marketing Middlemen in Tanzania: A Social Embeddedness Perspective
This thesis explores the influence of personal and social relations on entrepreneurial actions within the informal sector. It established that interpersonal trust underpins the emergence and persistence of informal entrepreneurship. The thesis contributes to a better understanding of the role of social relations in sustaining informal entrepreneurship. It marks an important step towards resolving the long-standing paradox of social embeddedness. The thesis lays a firm foundation for an integrative and cohesive theoretical framework for operationalizing the social embeddedness concept.

Supervisor/s: Dr T Sefalafala

MVUNDURA, Wellington

Sociology

THESIS: 'Operating under the Radar': Forestry Plantation Workers' Everyday Resistance in Chimanimani District, Zimbabwe.

Wellington Mvundura has produced a finely argued thesis on hidden resistance practices amongst plantation labourers in Zimbabwe. His study involved close participatory observation over an extended period, to uncover a range of practices, whereby labourers resisted their exploitation on commercial farms, as well as the attempts by ruling party enforcers to intimidate them into voting their way. Besides its empirical richness, the thesis has also added further depth to the theorizing of such behaviour, particularly with the opining of a new the new concept of 'farmzanship'.

Supervisor/s: Mr D Pillay

NGUBANE, Phetheni Primrose

Education

THESIS: Exploring ethical leadership in the context of the "New dawn/Thuma mina" in a TVET college in KwaZulu-Natal

Phetheni explored ethical leadership practices of TVET campus managers and lecturers in the context of a New Dawn/Thuma Mina in KwaZulu-Natal. While findings highlight an understanding of ethical leadership, this was not adequately enacted despite the policies available. The New Dawn/Thuma Mina mantra did not motivate research participants to work differently. Despite these adverse findings, the study found that reflective leaders who are committed to an ethical administration set the tone, framework and plans that promote ethical behaviour.

Supervisor/s: Dr S Mthiyane and Dr P Mthembu

NTSHANGASE, Chief Langelihle

African Languages and Linguistics

THESIS: Teaching Intermediate Phase isiZulu reading comprehension skills to at-risk readers in uMkhanyakude mainstream schools: Pedagogical strategies that work

The study examined pedagogical strategies used to teach isiZulu inclusive reading comprehension at the Intermediate Phase level in mainstream schools and investigated pre-service teacher preparation in teaching inclusive reading in isiZulu home language to at-risk readers. Findings indicate that the strategies employed are not structured to address specific reading challenges and consequently at-risk readers in mainstream schools remain inadequately catered for. Furthermore, teacher preparation does not adequately equip pre-service IP teachers with the necessary pedagogical skills to teach inclusive reading.

Supervisor/s: Dr L Tshuma

NYIRENDA, Vitumbiko

Philosophy

THESIS: Personhood and Gender in a Traditional African Community

In his dissertation, Vitumbiko Nyirenda develops a novel view on which gender in African society and its relation to personhood are complementary, fluid, and relational, indicating a healthy and positive gender relationships within the community. On this view, personhood is presented in non-gendered ways. The dissertation was highly praised by the examiners and is expected to lead to some publications.

Supervisor/s: Prof E Etieyibo

OWEN, Michael Kenneth

Psychology

THESIS: A study of South African gay male psychotherapists' experienced subjectivities

This thesis offers a deliberately messy account of gay psychotherapists' subjectivities as they navigate their own identities and experiences in relation to their clients and the profession. Drawing on relational psychoanalysis and queer theory, the thesis reflexively explores the intersubjective dance between therapist, client and researcher.

Described by examiners as "searingly honest, erudite and intellectually rigorous", the thesis situates gay therapists as authors rather than objects, thereby highlighting experiences of othering as well as of resistance and subversion

Supervisor/s: Dr C Long

PEARSON, Joel David

History

THESIS: Three Axes of Rural Local Governance: A relational history of space, administration and economic extractivism in the Mogalakwena Local Municipality in Limpopo, South Africa (1948-2000)

This study presents a systematic approach to understanding South Africa's local government crisis by examining the history of what is today the Mogalakwena Local Municipality in Limpopo Province. Through extensive archival and oral history sources, the study reveals how interlocking and mutually constitutive apartheid-era processes of spatial dispossession, state expansion, and economic extractivism continue to profoundly shape the terrain of rural local governance, urging against simple, presentist readings of the determinants of crisis today.

Supervisor/s: Dr M Nieftagodien and Dr M Phadi

PETLELE, Rebaone

Demography and Population Studies

THESIS: Role of men in teenage pregnancy in the Bojanala district, North West Province, South Africa

The study explored men who fathered with girls using mixed research methods. The research found children were fathered by men seven years older than mothers, men controlled condom use and never discussion contraception. Men's involvement is pivotal to make a dent on teenage pregnancy in Bojanala.

Supervisor/s: Dr S Mkwanzani and Dr C Odimegwu

RADEBE, Nomfundo Knowledge

Education

THESIS: Investigating the effectiveness of a blended professional development intervention in improving the teaching of Physical Sciences: A study of novice teachers in South African rural schools
Rural science teachers face a lot of challenges that urban and peri-urban teachers can only imagine. In this study, the impact of rurality and place, on the professional development of rural teachers, is explored. The study revealed the need to re-look at the way science education is provisioned in rural schools, noting that the current focus and one-size fits all model is failing the teachers and our learners in rural areas - who happen to be in the majority.
Supervisor/s: Dr E Mushayikwa

RAMPHALILE, Molemo Karabo

Political Studies

THESIS: Could Not Sing In The Dead Heat: Liner notes under the sun
This research is a critical intervention in the fields of study that locate slavery and colonialism as formative of modern ideas of race and racism. He argues that prior to the development of race as a category of Enlightenment distinction, blackness figured as geographically and physiognomically linked to a particular territory, the torrid zone/terra nullius that becomes known as the Sub-Saharan. These links are paradigmatic when seeking to understand how people of African descent and the places from which they emerge become extractible, exploited, and dispossessed historically.
Supervisor/s: Dr J Quirk

RAPHOKA, Sikeme

Education

THESIS: Exploring the nature of grade-8 classroom environments created by mathematics teachers when teaching mensuration: A case of curriculum implementation in Lesotho
Mr Sikeme Raphoka, (Dr to be), successfully completed a PhD study that explored types of classroom environments created by mathematics teachers as they implement the Lesotho Integrated Curriculum with Grade 8 classrooms, thus calling for Learner-Autonomous Environments (LAE) with particular focus on Mensuration. The study proposed a LAMLE+ Plus model, in terms of the established themes, for studying the promotion and presence of LAE in mathematics teaching, using LAMLE conceptual framework, formulated from the Commognitive theory and Pedagogical link-making and Communicative approach.
Supervisor/s: Dr B Mofolo-Mbokane

REYNEKE, Pierre

Geography

THESIS: Tshwane Remake: An ethnographic study of outside-circularity and deconstructive creation from the waste reuse practices of the urban waste precariat
The study entails an ethnographic inquiry into the waste reuse practices performed by the urban waste precariat on the landfill and streets of Pretoria East, City of Tshwane. It analyses this social grouping's contribution to the urban circular economy by conceptualising their reuse practices as value-production processes not rooted in capitalism and practised outside of state and formal market recognition and support. The study terms this as 'outside-circularity' and identifies an alternative value-production process within it coined as 'deconstructive creation'.
Supervisor/s: Dr M Samson

SEGOBIN, Tarishma

Education

THESIS: Transforming education through the implementation of ICT pedagogical integration: A case of ICT and Non- ICT schools in South Africa
This thesis explores the complexities of the "one size fits all" approach to ICT integration in selected schools in Johannesburg. The study revealed key barriers like policy ambiguity, educator preparedness in digital space and resource limitations. Based on the cited barriers, the study recommends policy revisions, strategic digital resource allocation, leadership support, and a new ICT framework to bridge the digital divide and promote transformative inclusive learning.
Supervisor/s: Mrs N Ndlovu and Dr A Dewa

SELLO, Matshidiso Valeria

Demography and Population Studies

THESIS: The Social contexts of childhood malnutrition in South Africa
The study examined the social contexts of childhood malnutrition in South Africa, highlighting its multifaceted causes. It established individual child characteristics to significantly influence malnutrition levels. It emphasizes the urgent need for a coordinated, multisectoral approach to improve nutritional outcomes, particularly in low-income communities facing food insecurity and socio-economic challenges.
Supervisor/s: Dr S Adedini and Dr C Odimegwu

SHIRINDI, Charlotte Dineo

Education

THESIS: The development of learner network society skills by technology subject teachers in the Gauteng full ICT schools

This study examines the use of Information and Communications Technologies (ICTs) by grade 8 technology teachers in full ICT schools in the Gauteng province. It identifies gaps between intended educational outcomes and actual practices, proposing a guided blended connectivist learning framework to help develop essential ICT skills. The study recommends revising the current technology curriculum to integrate ICT pedagogical strategies that empower learners to effectively address real-life technological challenges in a local and global context.

Supervisor/s: Mrs N Ndlovu

SIMELANE, Raudina Madina

Education

THESIS: Exploring students' experiences of receiving e-formative feedback during emergency remote learning: A case study of first-year students at a teacher education university in South Africa

This study examined the experiences of thirty-six first-year Bachelor of Education students who received e-formative feedback through a university's Learning Management System during Emergency Remote Teaching and Learning in South Africa. The findings revealed diverse student realities influenced by technological, cognitive, and motivational barriers, emphasizing the necessity for reimagined e-formative feedback approaches that address equity gaps, skills development, and psychosocial support. The study offers valuable recommendations for teacher training institutions and higher education stakeholders.

Supervisor/s: Dr P Pillay

SINCLAIR, Ingrid Maralene

Migration and Displacement

THESIS: Gendered discursive practices of the South African police service towards survivors of domestic violence. This study explores the reproduction, maintenance and resistance of gendered subjectivities within the discursive practices employed in the policing of gender-based violence (GBV). It examines how historical and socio-political structures shaping asymmetric power relations in society are reproduced in the everyday interactions between police officers and survivors of GBV. The research adopts a socio-historical lens on gendered policing, using an African decolonial feminist intersectional perspective. This approach focuses on the analytical categories of gender, violence, power, and inequality.

Supervisor/s: Dr J Vearey

SOUDIEN, Amie

History of Art

THESIS: 'Always looking': visual and artistic explorations of the living legacies of enslavement in South Africa

This thesis offers an innovative and ethically persuasive contribution to the sparse scholarly engagement with slave memory in South Africa. It explores the poetic and artistic strategies of artists and cultural organisations that evoke slave memory in South Africa. The astute analysis of power dynamics illuminates how knowledge about slave histories and memories is constructed. Marked by erudition, nuance, and an original aesthetic approach, the thesis elucidates how the living legacies of enslavement shape urban space, aesthetics, and social stratification

Supervisor/s: Ms N Cloete

VAN NIEKERK, Marthinus Christoffel

English

THESIS: What is called literature? Heidegger, responsive figuration, and the aspect of be-ing.

In his highly original, subtle thesis, Marinus van Niekerk engages the complex philosophy of Martin Heidegger to ask: 'What is literature?'. This study innovatively explores how language may speak relative to the self-withholding of being. Being calls on language to respond as literature, with human beings participating in the exchange. Two different modalities of literature's call are investigated: as discursive representability or as figuring the opening of a rift simultaneously as meaningful marking and as an elusive withdrawing. A brilliant reading of William Blake's *The First Book of Urizen* performs this poised double process.

Supervisor/s: Prof M Williams

ZONDO, Sizwe

Psychology

THESIS: Neurocognitive Rehabilitation for an Adolescent HIV Population: The Case of Sustained Attention
Using optical neuroimaging and neuropsychological evaluations, this thesis investigated the role of brain plasticity, sequent HIV neuroinvasion in adolescent populations. The dissertation unpacked the nature of neurovascular coupling, in neuroHIV, by investigating changes in oxygenated (ζ HbO), and deoxygenated haemoglobin (deoxy-Hb). Primary findings indicated that adolescent HIV neuroplasticity, is associated with attenuated hemodynamic responses, and increased functional connectivity, in the left-dorsolateral prefrontal cortex (L-DLPFC), a key neuronal network, and biomarker for brain plasticity in typical and atypical pediatric and adolescent populations.
Supervisor/s: Dr K Cockcroft and Mrs A Ferreira Correia

ZUMA, Chuma

Education

THESIS: Exploring the role of school principals as instructional leaders in improving learner academic performance in Johannesburg south district primary schools.

This thesis explores how principals in Johannesburg South district primary schools act as instructional leaders to improve learner academic performance. Through qualitative research method, including interviews, the study reveals leadership strategies such as effective curriculum management, regular teacher monitoring, data analysis for academic interventions, and fostering a culture of continuous professional development. The findings demonstrate that proactive instructional leadership is critical to improving learner outcomes, offering practical visions for school leaders seeking to improve learner academic performance in primary schools.

Supervisor/s: Mrs G Motilal and Mr E Charamba

ZUNGU, Thamsanqa Elijah

Music

THESIS: The Voice of the Black Choir: Exploring the Sounds of Vernacular Language Singing in a Performance of Mzilikazi Khumalo's UShaka

Through a combination of artistic and ethnographic research Zungu's work explores the implications of attending to the phonetic attributes of a vernacular language, isiZulu, for the sounds of choral singing. As one of the country's foremost choral practitioners Zungu's research critiques existing choral practice, and highlights the productive possibilities of a decolonial linguistics for musical performance.

Supervisor/s: Dr G Olwage

FACULTY OF SCIENCE

DEAN: PROFESSOR N CHETTY BSc Hons (Natal) MS PhD (Urbana-Champaign) MSAIP MASSAf

Doctor of Philosophy

ALTOOM, Mohammed Bashar Adam

Geography, Archaeology and Environmental Studies

THESIS: Mapping and monitoring the impacts of climate variability on rainfed agriculture in Semiarid North Darfur, Sudan

The study integrates multi-source remote sensing data with machine-learning algorithms to understand the impact of rainfall variability and drought on rainfed agriculture dynamics in North Darfur, Sudan. It demonstrates remote sensing's capability in modelling these impacts. The thesis produces four research articles, with two published and two under review

Supervisor/s: Dr E Adam

CHABALALA, Yingisani Winny

Geography, Archaeology and Environmental Studies

THESIS: Integrating Sentinel-1/2 and machine learning models for mapping fruit tree species in heterogeneous landscapes of Limpopo

The research addresses uncertainty in modelling fruit tree spatial distribution using remote sensing data in Limpopo Province. The study illustrates the effectiveness of combining multisource remote sensing data with state-of-the-art deep learning algorithms to better understand tree crops in the heterogeneous smallholder landscape. The findings, which contribute to sustainable agricultural development, resulted in four articles published in the ISI journal.

Supervisor/s: Dr E Adam

DUMELA, Khombo Eunice

Physics

THESIS: Optimisation of prostate plan in a pelvic prosthesis phantom

This project involves the design, development and fabrication of in-house pelvic phantom used to experimentally evaluate the high energy LINAC radiation therapy dose distribution of prostate cancer for specific patients with titanium hip prosthesis. The findings were highly commendable and compared with the state-of-the-art EGSnrc Monte Carlo simulation, which constitute a major advance in the field of medical physics.

Supervisor/s: Dr I Usman and Mr O Oderinde

GAOLATLHE, Lesego

Chemistry

THESIS: Synthesis and electrochemical properties of high-entropy spinel oxides, cobalt atomic clusters and zinc oxide as electrode materials for rechargeable zinc-air batteries

This thesis investigated two types of cathode materials in RZAB applications: (a) cobalt carbon composites of (i) cobalt atomic clusters (Co AC@CBPDC) and (ii) cobalt nanoparticles (Co NP@CBPDC), and (b) high-entropy spinel oxide (HESOX). The activities of these materials toward oxygen reduction reaction (ORR) and oxygen evolution reaction (OER) were investigated in both half- and full-cell configurations as a proof-of-concept in RZAB cells in alkaline electrolyte. Considering that conventional zinc plate has several short-comings as an anode for RZAB, a new material, polydopamine-derived carbon-coated zinc oxide (ZnO@PDA-DC), was also synthesised and applied in RZAB as a possible alternative anode to the popular zinc plate

Supervisor/s: Dr K Ozoemena

HAYLOCK, Kiara Avelyn

Animal, Plant and Environmental Sciences

THESIS: Behavioural and physiological responses of sable antelope to heat and aridity

This thesis quantitatively examined sable antelopes' behavioural and physiological responses to environmental stressors in Bwabwata National Park, Namibia. Using biologging and GPS tracking, the candidate found that during hot, dry conditions, sable made long journeys to water while reducing foraging time, with body temperature fluctuations indicating both dehydration and energy stress, highlighting challenges faced by water-dependent grazers under climate change.

Supervisor/s: Dr R Hetem and Dr F Parrini

KUMALO, Sandile

Physics

THESIS: Efficiency enhancement in photovoltaic devices using light management and morphology tuning
The thesis addresses the critical challenge of meeting global energy demands through advanced solar technologies. By utilising plasmonic, magnetoplasmonic, and core-shell nanostructures, as well as optimising organic solar cell morphology with solvents, significant improvements in power conversion efficiency (PCE) are achieved, showcasing potential advancements in solar energy technologies.

Supervisor/s: Dr D Wamwangi and Mr A Quandt

KUNG'U, Mercy Wambui

Molecular and Cell Biology

THESIS: Exploitation of natural resistance genes, mutation and phytosanitation to eliminate Cassava Geminiviruses
The thesis describes innovative and novel approaches of mitigating cassava mosaic disease (CMD). The study revealed seven resistance genes that are responsible for CMD resistance. The effectiveness of hydrogen peroxide, hot water and salicylic acid treatment in elimination of CMD and the effectiveness of ethyl methane sulfonate in inducing mutation for genetic resistance to CMD was also explored.

Supervisor/s: Prof M Rey

LANDWEHR, Gregory Brent

Geography, Archaeology and Environmental Studies

THESIS: The wind energy potential of South Africa's Eastern Cape Province in a changing climate
This thesis develops methodologies to assess the impact of climate change on South Africa's wind energy production potential by analysing synoptic drivers and projecting changes in circulation patterns. Focusing on the Eastern Cape, it quantifies wind energy production under different synoptic conditions, showing a decrease in future potential due to shifts in circulation patterns linked to the Hadley cell expansion.

Supervisor/s: Dr F Engelbrecht

LESAOANA, Mahadi

Chemistry

THESIS: Application of oxidative enzymes in membrane systems for the bioremediation of triazines in wastewater
The research tackles the global concern of environmental contamination by s-triazine herbicides, which pose significant risks to ecosystems, water quality, and human health. It explores an innovative biocatalytic membrane system, integrating an oxidoreductase enzyme, laccase with polyethersulfone membranes, for efficient degradation of s-triazines in real wastewater samples, while providing cost projections for potential large-scale implementation in bioremediation.

Supervisor/s: H Richards, Mr D Brady and Prof R Sheldon

LIEBERMAN, Benjamin

Physics

THESIS: The use of semi-supervised machine learning techniques in the search for new bosons with the ATLAS detector

This thesis evaluates semi-supervised classifiers in particle physics, emphasising model-independent narrow resonance searches and the trials factor they introduce. Results confirm these models' efficacy in classifying LHC data and quantify additional look-elsewhere effects, underscoring the potential and challenges of semi-supervised techniques in resonance searches at the ATLAS detector.

Supervisor/s: B Mellado

MABOWA, Mothepane Happy

Chemistry

THESIS: Towards the development and determination of trace impurities in battery grade nickel sulphate
This thesis approaches innovation to extract nickel from overlooked sources within industrial waste streams, broadening the resource base for extraction. To address the growing demand for battery-grade nickel sulphate, refining techniques including solvent extraction, precipitation, and analytical methodologies were devised and applied to effectively purify trace elements and determine nickel sulfate from fire assay waste

Supervisor/s: Prof L Chimuka

MAHONISI, Nyiku Clement

Physics

THESIS: The low-temperature properties of Boron-implanted diamond materials
The low-temperature properties of boron-implanted diamond materials are essential for fabricating semiconducting solid-state systems with high-temperature superconducting capabilities. This study focuses on enhancing the solubility limit of boron ions in diamonds through advanced implantation and annealing techniques. We accurately characterize spectral features that correlate boron-induced vibrational modes with their corresponding electronic conductivity properties, revealing novel implications for future research studies.

Supervisor/s: Dr S Naidoo

MAKUYA, Lindelani

Animal, Plant and Environmental Sciences

THESIS: Costs and benefits of solitary living in the bush Karoo rat (*Otomys unisulcatus*)

The candidate's groundbreaking field research on solitary bush Karoo rats revealed an advanced social system. Females live alone but are part of a kinship neighbourhood structure, with preferential sharing of resources with kin. Solitary living is not marked by aggression but by selective cooperation. This challenges the view that solitary living in mammals is primitive.

Supervisor/s: Prof N Pillay

MALEKA, Prettier Morongoa

Physics

THESIS: First principle study of inorganic metal halide perovskites for solar cells application

This study involves investigation of the properties including structural, electronic, optical, mechanical and thermodynamics of all-inorganic halide perovskites using first principle-based density functional theory (DFT). The study explored the effects of halide mixing, and transition metal doping to enhance the material's photovoltaic performance and address its drawbacks, showing promise for future solar cell applications.

Supervisor/s: Mr O Ntwaeaborwa and Dr R Maphanga

MANGORO, Ngonidzashe

Geography, Archaeology and Environmental Studies

THESIS: A geographical analysis of the impacts of construction and demolition waste on wetland functionality in South Africa: a study of Gauteng Province

The study investigated the impacts of construction and demolition waste (CDW) on the ecological and environmental functionality of wetlands. The findings suggest that the inherent restrictiveness embedded in the current environmental legislative framework does not promote environmental compliance thereby triggering the disposal of CDW in undesignated locations. These findings have been shared in 2 journal publications.

Supervisor/s: Dr D Simatele and Dr N Kubanza

MANQELE, Nkosinathi Michael

Geography, Archaeology and Environmental Studies

THESIS: Evaluating methodologies for monitoring the impact of marine mobile emissions, for use as air quality assessment tools, in South Africa

The candidate investigated the impact of a 3% reduction in Sulphur content of marine fuel on human health and the economy of Durban in 2020. The results showed a reduction of 49 premature mortalities with an estimated monetary value of ZAR228,000,000. Such changes are significant to the growing city economy of a developing country like South Africa.

Supervisor/s: Dr R Moolla and Ms L Ramsay

MAPHANGA, Rivoningo

Mathematics

THESIS: A study of financial models and their symmetry driven analytical solutions

This thesis explores the application of Lie symmetries and boundary conditions in financial models, including the Black-Scholes, generalized bond-pricing, CEV type, and option-pricing models. By identifying invariant solutions and analyzing boundary conditions, it enhances understanding and predictive power in option and bond pricing, providing insights into the behavior, valuation, and risk management of financial instruments.

Supervisor/s: Dr S Jamal

MARIOTTI, Elena

Animal, Plant and Environmental Sciences

THESIS: Quantity discriminatory capacity and choice preference between binary rewards in African elephants

The thesis quantitatively models elephants' choice behaviour by testing their preferred fruits, quantity discrimination skills, and learning effects capacity, focusing on individual differences. Using binary choice tasks with varying food quantities and Bayesian analysis, the study found that elephants can do basic arithmetic with learned improvements. These results provide a foundation for future research on elephant risk preferences.

Supervisor/s: Dr F Parrini

MASHIGO, Mpho Mary

Animal, Plant and Environmental Sciences

THESIS: Responses of *Carpobrotus edulis* (L.) Bolus to low and high temperature conditions

This thesis examined the effects of temperature extremes on the medicinal properties of *Carpobrotus edulis*, an indigenous medicinal plant in South Africa. Phytochemical analyses and bioactivity tests, including antibacterial, antioxidant, antidiabetic, and anticancer activities, revealed noteworthy changes. The findings highlight temperature's significant impact on the plant's medicinal efficacy, with implications for indigenous use, climate change adaptation, and pharmacological research.

Supervisor/s: Dr I Risenga, Dr K Ngwira and Dr M Choene

MATYUKIRA, Charles

Geography, Archaeology and Environmental Studies

THESIS: Multitemporal analysis of land cover and evaluation of landscape influences on vegetation dynamics using remote sensing data and machine learning in a karst environment: a case study of the Cradle Nature Reserve

This thesis investigates the use of geospatial technologies and machine learning to monitor vegetation dynamics and land degradation at the Cradle Nature Reserve, a World Heritage site in South Africa. The study highlights critical ecological changes and addresses research gaps. Seven papers based on this research were published in international refereed journals, contributing significantly to the field of environmental monitoring and conservation.

Supervisor/s: Dr P Mhangara

MCKENZIE, Ryan Peter

Physics

THESIS: Development and reliability testing of a new low-voltage power supply for the ATLAS Hadronic Tile-Calorimeter Phase-II upgrade

In this thesis, the development of a radiation hard transformer coupled buck converter for the ATLAS Hadronic Tile-calorimeter Phase-II Upgrade is presented with an emphasis placed on its thermal performance and reliability. A thermal analysis of the proposed upgrade power supply is presented followed by an irradiation campaign and reliability analysis. It culminates in the quality assurance procedure that is applied to the new buck converter post production.

Supervisor/s: Dr C Solans Sanchez and B Mellado

MOFOKENG, Nondumiso Nomonde

Chemistry

THESIS: Source apportionment, transport and fate of pollutants in the paper recycling chain - an analytical exploration of the South African context

This thesis analytically explored pollutants present at key stages of the South African paper recycling chain, using chromatography-based methods. Chemometrics, literature and interviews were used to investigate the possible sources, transport and fate of identified pollutants. Findings showed that pollutant prevalence was linked to manufacturing additives, retail activities, consumer usage and waste mingling from the collection and sorting protocols used.

Supervisor/s: Prof L Chimuka and Mr L Madikizela

MOHAMED, Mohamed Khalfan

Geography, Archaeology and Environmental Studies

THESIS: Remote sensing-based assessment of mangrove forest changes and related regulatory frameworks for the sustainability and conservation of coastal ecosystems in Zanzibar Island, Tanzania-East Africa

This thesis develops a remote sensing approach for sustainable mangrove monitoring in Zanzibar, analysing management history from 1890 to the present. It emphasizes the impact of legal frameworks and community involvement, integrating historical policy analysis with modern geospatial techniques. The research generates four ISI-published articles for better decision-making for effective mangrove conservation and management.

Supervisor/s: Dr E Adam

MOKGATITSWANE, Gaogalalwe

Physics

THESIS: Search for high-mass resonances in the $Z\bar{\chi}$ channel and quality assurance of Scintillation detector modules of Tile Calorimeter Phase-I upgrade of the ATLAS detector

The research focused on the search for new high-mass particles decaying into a Z boson and photon using data from the ATLAS experiment at CERN's Large Hadron Collider. I also contributed to significant upgrades of the ATLAS detector, ensuring its continued role in advancing high energy physics research.

Supervisor/s: B Mellado and Dr X Ruan

MOL, Bronwyn Ashleigh

Molecular and Cell Biology

THESIS: Immunomodulation of the innate immune system: the role of vitamin D in the context of monocytes and macrophages

Biologically active vitamin D₃, 1,25(OH)₂D₃, is a known immunomodulator. The role of 1,25(OH)₂D₃ in monocytes, macrophages and the process of monocyte-to-macrophage differentiation using the THP-1 cell line was investigated. Analyses indicated that though not an inducer of differentiation alone, 1,25(OH)₂D₃ in combination with PMA greatly altered the morphology and transcriptomic landscape of the macrophages generated.

Supervisor/s: Dr V Meyer and Dr N Gentle

MOTLOGELOA, Ogone Warona

Geography, Archaeology and Environmental Studies

THESIS: Assessing the inter-annual and inter- seasonal climate-induced variation in case load of respiratory diseases

This thesis delved into the interplay between climatic factors and acute upper respiratory diseases in South Africa, with a concentration on four pivotal aspects: establishing the primary disease season from May to September, evaluating how climatic variables such as

temperature impact disease occurrence, investigating the effects of extreme climate events

over twelve years and assessing the overarching climate-health relationship. It underscores

the necessity of understanding consistent seasonal patterns in climate to enhance healthcare strategies and disease management

Supervisor/s: Miss J Fitchett and Dr N Sweijd

MTILENI, Masingitla Promise

Animal, Plant and Environmental Sciences

THESIS: Examining intraspecific ploidy variation and functional traits that facilitate the environmental distribution of the Drakensberg near-endemic species, *Rhodohypoxis Baurii* (Baker) Nel. var. *Platypetala* Hilliard & Burt

The PhD candidate addressed the ecological consequences of polyploidy by (1) reviewing evidence for an elevation-driven polyploid distribution across plant species and (2) detailed studies of *Rhodohypoxis baurii* var. *platypetala*. The overall conclusions are that scale is important for understanding distributions of polyploid plants relative to their diploid progenitors, and that the implications of polyploidy in plants may be species-specific.

Supervisor/s: Dr K Glennon

MUDAU, Phuluso

Animal, Plant and Environmental Sciences

THESIS: Integrated management of *Campuloclinium macrocephalum* (pompom weed) (Less.) DC. (Asteraceae) in South Africa

The key purpose of this science expedition was to establish an improved management strategy against pompom weed, one of the worst invasive weeds in South Africa. The use of a sub-lethal herbicide dose was found to be incompatible with the biocontrol agent. However, the integration of fire and herbicide was found to be an effective management approach against pompom weed.

Supervisor/s: Prof E Witkowski and Prof M Byrne

MXAKAZA, Lineo Florence

Chemistry

THESIS: Preparation of nitrogen-doped multiwalled carbon nanotubes anchored 2D platinum dichalcogenides for application as hydrogen evolution reaction catalysts

This PhD research focuses on developing nitrogen-doped carbon nanotubes anchored on novel 2D platinum dichalcogenides for hydrogen production, a clean energy source crucial for a sustainable future. Using a new colloidal method, this work offers significant advancements in producing hydrogen more efficiently, benefiting both energy security and environmental health.

Supervisor/s: Prof N Moloto and Miss Z Tetana

NANGUE TASSE, Geraud

Computer Science

THESIS: Towards lifelong reinforcement learning through temporal logics and zero-shot composition

This thesis proposes a framework to develop AI agents with three key abilities: Flexibility,

Instructability, and Reliability (FIRe). This is achieved by introducing: the logical composition of arbitrary tasks, world value functions for zero-shot skill composition and lifelong sample efficiency, and methods for agents to understand and execute language instructions.

Supervisor/s: Mr B Rosman and Dr S James

NGWENYA, Mthulisi

Geography, Archaeology and Environmental Studies

THESIS: Modelling to determine optimal water availability scenarios under drought conditions in agricultural environments: A study of the Western Cape Province, South Africa
This study investigated the impacts of climate change on future water availability and utilisation for agricultural development and food security in the Western Cape Province of South Africa using CMIP6 climate scenarios. The findings have been shared through 3 publications in peer reviewed international journals.
Supervisor/s: Dr D Simatele

NTOMBELA, Silindile Cynthia *Chemistry*
THESIS: Mineral beneficiation from seawater: development and optimisation of selective extraction techniques for essential minerals from seawater
The study tried to develop extraction methods for recovery of minerals in seawater and desalination brine using polymer inclusion membrane. The results showed much promise for recovery of magnesium and calcium. In another approach a method that removes major competitors for lithium extraction was achieved. The study contributes to the blue economy extraction of valuable minerals.
Supervisor/s: Prof L Chimuka

NYAMAI, Nancy Akoth *Chemistry*
THESIS: Thermo-photocatalytic production of hydrogen from water with methanol/formaldehyde as sacrificial agent under mild conditions
The study covered the thermo - photocatalytic water splitting using synthesized TiO₂ photocatalysts composited with carbon nanofibers, and Pt, Au, Ir, Zn, Cu as co-catalysts at 1 µg 6% loading with methanol as sacrificial agent and the most active photocatalyst, 10%_TiO₂/CNFs/5%_Zn produced 0.53 mol (h g cat.)⁻¹ of H₂ which was 90-100 folds the amount produced by the commercial TiO₂ photocatalyst.
Supervisor/s:

OBAID, Altayeb Adam Alsafi *Geography, Archaeology and Environmental Studies*
THESIS: Capability of multi-remote sensing satellite data in detecting and monitoring cyanobacteria and algal blooms in the Vaal Dam, South Africa
The thesis models water quality in the Vaal Dam using in situ measurements, historical data, and remote sensing. Findings reveal pollution levels beyond acceptable standards and confirm that remote sensing effectively provides valuable information for managing water quality in the Dam. This research resulted in four ISI journal publications.
Supervisor/s: Dr E Adam

ONISURU, Olalekan Olugbenga *Molecular and Cell Biology*
THESIS: Discovering potential inhibitors for _Plasmodium falciparum_ and _vivax_ glutathione transferases through systematic integration of empirical with theoretical studies
The thesis is a cumulative study that reports the inhibition of Glutathione S-Transferases (GSTs) from _Plasmodium falciparum_ and _Plasmodium vivax_ as potential targets for novel antimalarial treatment and/or drug discovery and development of three compounds namely Bromosulphophthalein, Baicalin, and 5,7,3'-Trihydroxy-6,4',5'-trimethoxyflavone
Supervisor/s: Dr I Achilonu

OYIOGU, Blessing Oluebube *Molecular and Cell Biology*
THESIS: Biophysical evaluation of the kinetics, thermodynamics, and structure-stability relationship of Wuchereria bancrofti glutathione transferase in comparison with human and glutathione transferases
Rational drug discovery leverages a detailed understanding of protein structure to design and develop new effective therapeutics. The candidate investigated the structural impact of ligand inhibition on WbGST, a pivotal enzyme to the survival of Wuchereria bancrofti, the parasitic culprit behind lymphatic filariasis. The ligands more efficiently inhibited WbGST than the human GSTs, and structural studies suggest that the ligands could be repurposed as alternative therapeutic agents against lymphatic filariasis.
Supervisor/s: Dr I Achilonu

PATEL, Jasmin Bharatkumar *Molecular and Cell Biology*

THESIS: Genome sequencing of the Southern Ground Hornbill *(Bucorvus leadbeateri)*

This study presents the first whole genome sequence, assembly, and annotation of the Southern Ground Hornbill, a flagship species of the African savannah. Using comparative genomics, genetic variant, and selection analysis, the research provides valuable insights into the bird's genetic makeup, evolution, and adaptation. These findings will support conservation efforts and aid in preserving the genetic history of these birds.

Supervisor/s: Dr P De Maayer and Dr J Mollett

PETENI, Siwaphiwe

Chemistry

THESIS: Electrocatalytic detection of biomarkers of tuberculosis and cervical cancer

The need for simple, easy-to-use diagnostic methods will not only relieve our heavily burdened health care system but it will also assist in early detection and curb the spread diseases. In this thesis, nanosensor based platforms were designed for the detection of tuberculosis and cervical cancer biomarkers using electrochemical methods.

Supervisor/s: Dr K Ozoemena

RAMASHALA, Kanyane Nonhlanhla Eugenia

Chemistry

THESIS: Microwave-assisted synthesis of palladium-based ferrous alloy electrocatalysts for application in alkaline direct alcohol fuel cells

This thesis develops carbon-supported Pd-based ferrous alloy electrocatalysts for alkaline direct alcohol fuel cells (DAFCs) using a microwave-assisted technique to improve particle size, crystallinity, and morphology. Incorporating 3d transition metals into Pd/C electrocatalysts enhances activity, durability, and resistance to poisoning during alcohol oxidation, making these electrocatalysts promising for DAFC applications.

Supervisor/s: Dr K Ozoemena and Dr C Billing

RAZUWIKI, Rufaro

Chemistry

THESIS: Studies on the chemistry and biochemistry of gold(III) carboxamide pincer chelates

This study investigated new carboxamide pincer ligands and their gold(III) complexes, synthesized and characterized for chiral properties using CD spectroscopy and X-ray crystallography. The stability of these complexes with glutathione (GSH) and their binding to DNA and human serum albumin (HAS) were evaluated to explore potential applications in cancer treatment. NCI assays conducted on HT-29 and MCF-7 cell lines revealed significant activity of one complex, particularly against MCF-7 cells.

Supervisor/s:

SEMWAYO, Daniel Tembinkosi

Computer Science

THESIS: Incorporating complex adaptive systems concepts in ontology driven Bayesian Network Models: towards resolving wicked problems

The thesis presents an advanced artificial intelligence (AI) Bayesian modelling framework which, by incorporating complexity sciences' concepts as constructs, out-performs baseline AI modelling frameworks at designing explainable models and machine learning algorithms for resolving diverse complex problems such as pandemics, traffic jams, climate change effects, and financial market crashes.

Supervisor/s: Dr R Ajoodha

SEPENG, Motshwaedi Collen

Geography, Archaeology and Environmental Studies

THESIS: Constructed Wetlands: Additional heterogeneous configurations on existing infrastructures in Silvertown, Alexandra Township, Johannesburg

The thesis explored the integration of constructed wetlands into existing infrastructure in Silvertown, an informal settlement in Alexandra Township, Johannesburg. The study explored innovative, heterogeneous infrastructure configurations that enhanced greywater treatment while simultaneously addressing several, local environmental challenges. They looked at how this intervention improved water quality, promoted sustainable urban development, and offered a scalable solution for under-resourced areas facing similar issues by integrating with existing systems. The research blended ecological engineering with community-focused design.

Supervisor/s: Prof A Thatcher

SHAKU, Bokome

Chemistry

THESIS: Synthesis and characterisation of marula nut derived carbon and modified manganese fluorophosphates for electrochemical energy storage applications

This thesis focused on marula nut derived carbon and modified manganese fluorophosphate for use in energy storage with emphasis on the development of positive and negative electrodes for asymmetric supercapacitors. The results displayed excellent energy storage characteristics and cycling stability in both neutral and alkaline electrolytes. In a real-life application, the cell was used to successfully light a 1.6 W red LED bulb.

Supervisor/s: Dr M Maubane-Nkadimeng, Dr K Ozoemena and Prof N Coville

SIMOOYA, Steriah Monica

Geography, Archaeology and Environmental Studies

THESIS: Assessing the impacts of urbanisation on land use change in Zambia: A study of Lusaka urban district

This study assessed the impacts of urbanisation on land use change and urban livelihoods of poor and marginalised households and communities in the Greater City of Lusaka. Of particular interest was investigating the myriad ways and avenues through which the urban poor people, especially female headed households navigate and negotiate their citizenry in a landscape highly defined by a capitalist mode of production. The findings of this study have been shared in international journal platforms

Supervisor/s: Dr D Simatele and Dr N Kubanza

SINGH, Keshaan

Physics

THESIS: Digital toolbox for the generation and detection of vectorial structured light

The candidate has developed and optimised a set of tools for the low-cost, versatile generation and detection of light fields exhibiting structured polarisation, phase, and amplitude. The candidate also demonstrated these tools through the creation of new structured light fields, measurement applications and to achieve robust communication in atmospheric turbulence.

Supervisor/s: Dr A Dudley and Prof A Forbes

SODISETTI, Venkateswara Rao

Physics

THESIS: Low-temperature electronic transport of metal doped carbon nanotube molecular hybrids and nitrogen-doped nanocrystalline diamond

This thesis investigates electronic transport and magnetism in metal-doped CNT-SMM hybrids and nitrogen-doped nanocrystalline diamond. Key findings include spin-phonon coupling, Kondo lattice behaviour in CNT hybrids, and 3D weak localisation and variable-range hopping in NCD, providing insights into microstructural effects on magnetoresistance and transport properties, advancing carbon-based electronics and spintronics.

Supervisor/s: Prof S Bhattacharyya

SOOBEN, Marushka

Molecular and Cell Biology

THESIS: *_In Silico_* exploration of Endocannabinoid Receptor ζ CB1 and CB2 ζ interactions comparing Cannabidiol and Cannabidiol Diacetate: a comprehensive computational study

This computational study analysed interactions between natural cannabidiol (CBD) and its acetylated form, cannabidiol diacetate (CBDDA), with pseudo-CB1 and CB2 receptors. Using bioinformatics, molecular docking, and molecular dynamics in a TIP3P solvated 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine environment, CBDDA exhibited stronger receptor interactions, suggesting acetylation changes protein behaviour and potentially enhances potency and modifies endocannabinoid receptor signalling, offering promising therapeutic leads for cannabinoid-based therapies.

Supervisor/s: Dr I Achilonu and Dr Y Sayed

TEFU, Lebogang

Chemistry

THESIS: The synthesis and biological evaluation of isoquinoline derivatives as new, potential transmission-blocking compounds in the fight against malaria

The study involved the design, synthesis and in vitro antimalarial testing of isoquinoline derivatives as potential transmission-blocking agents targeting late-stage (IV/V) gametocytes of *Plasmodium falciparum*. The derivatives maintained potency while demonstrating improved solubility, microsomal stability and lower cytotoxicity in the biological assays. The iron-binding properties of the derivatives were also studied, and key structural elements essential for iron binding were identified.

Supervisor/s: Dr A Rousseau

TEMAUGEE, Samuel Terungwa

Physics

THESIS: Evaluation of radiation damage on lutetium-aluminium and gold for practical applications using proton irradiation as a surrogate for neutrons

The candidate's excellent and timely investigation of resilience of lutetium-aluminium and gold to radiation damage, using both Monte-Carlo simulations methods and the experimental proton irradiation techniques carried out at the CLASS Accelerator in MIT, USA. The complex microstructure properties were elucidated with the state-of-the-art characterization techniques, providing a major advance in the field of nuclear materials and their applications.

Supervisor/s: Dr I Usman and Mr R Mavunda

THWALA, Siphwe Anthony

Physics

THESIS: An unsupervised search of non-thermal diffuse emission in extended sources

Radio astronomy is undergoing a transformation, requiring data mining methods for optimal scientific utilisation. We implemented the first architecture that uses multi-frequency and multi-scale radio continuum data cubes for unsupervised machine learning model training. This design automates the detection and clustering of related sources in continuum radio surveys.

Supervisor/s: Dr G Beck

TOLCHARD, Frederick Bruce

Geosciences

THESIS: An analysis of the macroevolutionary dynamics of diet in amniotes

The candidate examined distributions of diets and body sizes of amniotes. He tested how feeding guilds partition dietary variation, how these guilds evolve, and how dietary composition affects the macroevolution of amniote body size. He found that invertivorous taxa had the smallest body sizes, but that there was surprisingly little difference in body size distributions among other feeding guilds.

Supervisor/s: Dr J Choiniere and Dr R Benson

TSHISEKEDI, Kalonji Abondance

Molecular and Cell Biology

THESIS: Exploring temporal changes in the malting barley seed microbiome with meta-omics to understand nitrogen content effects

This thesis investigates the barley seed microbiome using meta-omics to examine the effects of nitrogen levels and storage duration. Analysing eight South African barley samples, the study reveals that storage time influences microbial diversity. These findings advance our understanding of microbial interactions in barley, offering valuable insights for improving seed health and brewing quality.

Supervisor/s: Dr A Botes and Dr P De Maayer

VAN NIEKERK, Karen Elizabeth

Geosciences

THESIS: The molecular evolution of C14 peptidases in microbial eukaryotes

This thesis examines C14 peptidases within sets of eukaryotic predicted proteins, incorporating genomic and transcriptomic data from a wide range of microbial eukaryotes. It uses a computational approach of sequence similarity networks and protein structural analysis to explore proteomes across the eukaryote tree of life, presenting a novel perspective on the diversity within the C14 peptidase family.

Supervisor/s: Dr P Durand

The thesis examines indigenous philanthropy in Ghana from an Akan perspective, utilising indigenous methods. It explores the meaning, nature, and practice of Akan philanthropy and its influences by colonisation and westernisation. Her findings reveal that indigenous Akan philanthropy exists and aligns with broader African philanthropy, contributing to the global philanthropy discourse. The work addresses gaps in understanding indigenous philanthropy, emphasising the need to decolonise philanthropy and recognise its diverse forms, offering new insights into African and global contexts.

GRADUATION AWARDS

FACULTY OF SCIENCE

To be presented at the Faculty's prize giving ceremony

Biological Sciences First Prize Teaching Assistant Award:

This prize is awarded to the most outstanding postgraduate student, who is employed as a Teaching Assistant in the School of Molecular and Cell Biology.

Phuluso Mudau

Molecular and Cell Biology Teaching Assistant Award:

This prize is awarded annually to a Teaching Assistant who has provided consistent and outstanding service to undergraduate students.

Bronwyn Ashleigh Mol

The Alex von Holy Prize:

This prize is in memory of the late Professor Alex von Holy to the PhD student with the most outstanding postgraduate research in the field of Microbiology within the School of Molecular and Cell Biology.

Kalonji Abondance Tshisekedi

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