



GRADUATION CEREMONY 2021

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

THURSDAY,
18 NOVEMBER 2021

13h00

.....

DURBAN



UNIVERSITY OF
KWAZULU-NATAL TM

INYUVESI
YAKWAZULU-NATALI

INSPIRING GREATNESS

COVID-19

On 15 March 2020, a national state of disaster was declared in South Africa in light of the COVID-19 outbreak. In keeping with the instructions of the President of the Republic of South Africa, the Honourable Cyril Ramaphosa, per a public address delivered on 23 March 2020, the Republic of South Africa was placed under lockdown from Thursday, 26 March 2020.

While the lockdown levels have been amended over time, regulations related to the current lockdown level remain in force. After due consideration of all on-going health and safety protocols, a decision was made to virtually confer all Degrees and Diplomas, and the virtual ceremonies were broadcasted on 24 November 2021. The University retained the original approved Graduation dates and programmes for record purposes.

THE UKZN TRANSFORMATION CHARTER

The University of KwaZulu-Natal ASPIRES TO BE a transformed university which:

- ◆ Heals the divisions of our nation's past, bridges racial and cultural divides, and lays the foundations for a university that is united in its diversity;
- ◆ Promotes high quality research, excellent teaching and learning, and responsible community engagement;
- ◆ Promotes African scholarship in every discipline and *uBuntu/Botho* in its organisational culture;
- ◆ Embraces socially and contextually relevant curricula that reflect the University's location in South Africa, Africa and the world;
- ◆ Recognises the importance and value of African languages as academic languages;
- ◆ Prioritises the well-being and growth of every individual student and staff member;
- ◆ Reflects race and gender representation in its management structures, personnel profile, and student population;
- ◆ Is socially cohesive and inclusive;
- ◆ Is free of discrimination on the basis of ethnicity, race, gender, class, nationality, religion, sexual orientation and disability;
- ◆ Nurtures collegiality, recognises and respects difference, and celebrates diversity;
- ◆ Reflects a new and refreshing culture of tolerance, understanding and vibrant engagement within the University community.

We therefore COMMIT ourselves to work together until the objectives set out below are manifested in our University.

OUR CHARTER

The University shall be a place where:

- ◆ Research, Teaching, Learning and Scholarship are a vocation for all
- ◆ Race and gender representation is evident in all structures
- ◆ A socially cohesive and inclusive institutional culture thrives
- ◆ Good modes of governance are enshrined
- ◆ The right to freedom of expression is guaranteed
- ◆ Advancement of the transformation agenda is the responsibility of all

THE UKZN PACT

We, the staff and students of the University of KwaZulu-Natal
agree to treat each other with respect,
to abide by the rules and regulations of the Institution
and to commit ourselves to excellence in research-led
teaching and learning.

OFFICERS

Chancellor	Dr RJ Khoza BA(Hons) (UNIN), MA(Lancaster), EngD(Warwick), LLD <i>Honoris Causa</i> (RU), DEcon <i>Honoris Causa</i> (UFS), LLD <i>Honoris Causa</i> (Warwick), CDSA
Vice-Chancellor and Principal	Professor NK Poku BA(Hons)(Nottingham), MA(Nottingham Trent), MSc(Coventry), PhD(Nottingham Trent)
Chair of Council	Dr I Moja MBChB(Natal), MMed OetG(Medunsa), MBA(UFS)
Deputy Vice-Chancellor: Research	Professor M Moshabela (<i>Acting</i>) MBChB(Natal), MMed(UL), MSc(LSHTM), PhD(WITS)
Deputy Vice-Chancellor: Teaching and Learning	Professor SP Songca BSc, BScHons(Unitara), MSc, PhD(London)
Deputy Vice-Chancellor and Head of College of Agriculture, Engineering and Science	Professor A Modi BScAgric(UFH), MScAgric(Natal), PhD(OSU)
Deputy Vice-Chancellor and Head of College of Health Sciences	Professor BP Ncama BCur(Unisa), MCur(Natal), PhD(UKZN), RN RM, RICN, RCHN, RDN, RNE
Deputy Vice-Chancellor and Head of College of Humanities	Professor NJ Mkhize BAHons(Natal), MA(Iowa), PhD(Natal)
Deputy Vice-Chancellor and Head of College of Law and Management Studies	Professor BW McArthur (<i>Acting</i>) BSc(Unisa), BA(Hons), MA(Natal), PhD(UKZN), MBL, Dip Datametrics(UNISA), HDE(Natal)
Registrar	Dr KE Cleland B(Hons) Occupational Therapy(UP), MEd(Natal), PhD(UKZN), PG Dip Law(FiCJ)
President of Convocation	Mr VW Sibisi BAdmin(UKZN)

OFFICE BEARERS

COLLEGE OF HEALTH SCIENCES

Deputy Vice-Chancellor and Head of College

Professor BP Ncama

BCur(Unisa), MCur(Natal), MBA(UKZN), PhD(UKZN)

Dean and Head of School of Clinical Medicine

Professor NC Dlova

MBChB(Natal), FCDerm(SA), PhD(UKZN)

Dean and Head of School of Health Sciences

Professor KP Mashige

BSc(Witwatersrand), BOptom(UDW), CAS(NECO), MOptom(UKZN), PhD(UKZN)

Dean and Head of School of Laboratory Medicine and Medical Sciences

Professor MV Mabandla

BScMedHons, PhD(UCT)

Dean and Head of School of Nursing and Public Health

Professor AS Voce (*Acting*)

BSc(Occ Ther)(Witwatersrand), Advanced University Dip Natal), Master(Comm Health)
(Liverpool), PhD(UKZN)

Dean: College Research

Professor AA Chuturgoon

BSc(Hons), MSc(Natal), PhD(UKZN)

Dean: College Teaching and Learning

Professor S Duma

BCur, MCur(UKZN), PhD(UCT)

OFFICE BEARERS

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

Deputy Vice-Chancellor and Head of College

Professor AT Modi

BScAgric(UFH), MScAgric(Natal), PhD(OSU)

Dean and Head of School of Agricultural, Earth and Environmental Sciences

Professor FN Mudau

BSc(Univen), MScAgric(US), PhDAgric(UP), MBL(UNISA)

Dean and Head of School of Chemistry and Physics

Professor RS Robinson

BScHons, MSc, PhD(Rhodes)

Dean and Head of School of Engineering

Professor G Bright

PrEng, BScEng, MScEng, PhD(Natal), MBA(UKZN)

Dean and Head of School of Life Sciences

Professor AO Olaniran

BScHons, MSc(OAU), PhD(UKZN)

Dean and Head of School of Mathematics, Statistics and Computer Science

Professor DE North

BScHons, MSc, PhD(Natal)

Dean: College Research

Professor NA Koorbanally

BScHons, MSc, PhD(Natal)

Dean: College Teaching and Learning

Professor N Chetty

BScHons(Natal), PhD(UKZN)

ORDER OF PROCEEDINGS

The Academic Procession enters the Hall – *University Anthem – Ihele*

The Chancellor constitutes the Congregation

Welcome to Guests

Professor B Ncama

Deputy Vice-Chancellor and Head of College of Health Sciences

Congratulatory Remarks

Students' Representative Council

Presentation of Doctoral Graduands (Health Sciences)

Deans: College Research

Musical Interlude

Presentation of Graduands (Health Sciences)

Deans of the College

Musical Interlude

Presentation of Doctoral Graduands (Agriculture, Engineering & Science)

Dean: College Research

Musical Interlude

Presentation of Graduands (Agriculture, Engineering & Science)

Deans of the College

The Chancellor dissolves the Congregation

National Anthem

The Congregation is invited to join in the singing of the National Anthem

The Academic Procession leaves the Hall

Gaudeamus Igitur

KEY TO SYMBOLS

- * Degree awarded *cum laude*
- α Degree awarded *summa cum laude*
- # Diploma awarded with distinction
- Posthumous

Award of Degrees in College of Agriculture, Engineering and Science

DOCTORAL DEGREES

Doctor of Philosophy

Abd'quadri-Abojukoro, Aderonke Naimot, *BScAgric(FUNAAB), MSc(Ulbadan).....Animal Science*

Thesis: Effects of Selected Medicinal Plant Extracts on Bacterial Activity, Cytotoxicity, Rumen Fermentation, Nutrient Utilization, and Methane Mitigation

Citation: Aderonke examined 22 medicinal plant ethanolic extracts on activities of both gram-negative and gram-positive bacterial species, phytochemical compounds, and cytotoxicity based on which she selected and examined four plants extracts in vivo on rumen fermentation, nutrient utilization, and methane mitigation. It can be concluded that all medicinal plant extracts investigated had promising properties and *Carya illinoensis* (Pecans) is the most promising for mitigating methane emission from ruminants.

Supervisor: Professor IV Nsahlai

Adeleke, Adesola Abimbola, *BSc(AdekunleAU), MSc(Ullorin) Chemistry*

Thesis: Influence of Anion and Aryl Variation on Calf Thymus DNA and Bovine Serum Albumin Binding and *in Vitro* Biological Activities of New Pyridinyl and Quinoliny Silver(I) Complexes

Citation: The mortality rate from the prevalence of infectious diseases remains a global health threat. In an effort to tackle this, Adesola, developed new silver(I) complexes of pyridinyl and quinoliny derivatives as alternative therapeutic drugs. The silver(I) complexes showed excellent antimicrobial, antioxidant and anticancer activities coupled with good DNA and protein binding. Adesola observed that the novel silver(I) complexes hold huge potential as therapeutic agents.

Supervisor: Professor BO Owaga

Adu, Oluwatosin Temilade, *BSc(OlabisiOnabanjoU), MSc(OAU).....Biology*

Thesis: Micromorphology and Biological Activities of Leaves and Stem Bark of *Diospyros villosa* (L.) De Winter

Citation: The study validated the role of *Diospyros villosa* in the treatment of pathogenic bacterial infections. The phytochemicals presented powerful stabilizing and

capping agents for nanoparticles. Stem bark extracts at 80 °C demonstrated good quorum sensing inhibitory potential against violacein and pathogenic bacteria. *D. villosa* leaves possess non-glandular trichomes. *D. villosa* leaves and stem bark inhibited viability of human breast carcinoma and lung carcinoma cells better than human embryonic kidney cells.

Supervisors: Professor Y Naidoo and Professor J Lin

Akomolafe, Idowu Richard, *BSc (OAU), MSc(Ulbadan)* *Physics*

Thesis: An Investigation into the Radioprotective Potential of *Costus Afer* and *Drymaria Cordata* Extracts on Whole-Body Irradiated Mice

Citation: Mr Akomolafe's PhD study focused on the radioprotective potential of *Costus afer* (CAE) and *Drymaria cordata* (DC) extracts on mice's survival, haematological and histopathological parameters following X-ray irradiation as an alternative to current synthetic and toxic radioprotectors for humans. This study is the first of its kind, with two scientific papers in reputable international journals. All the examiners commented on the importance and relevance of the work.

Supervisor: Professor N Chetty

Aladesanmi, Ereola Johnson, *BSc(LAUTECH), MScEng(UCT)* *Electrical Engineering*

Thesis: Analysis and Utilisation of Reverse Power Flow of Wind Energy Source using Multi-Por Power Electronic Transformer

Citation: Mr Aladesanmi carried out work which addressed the use of a high frequency power transformer with power electronic converters on either side to link a wind farm and smart grid to the main grid. One converter utilized back-to-back inverters for AC-DC-AC operation, and one utilized a novel AC-AC matrix converter. The system allowed for bi-directional power flow. The simulations and experiments validated the models developed illustrating their effectiveness.

Supervisors: Professor DG Dorrell and Dr C Venugopal

Appalasamy, Minoli, *BSc, BScHons, MSc* *Biology*

Thesis: Towards Understanding Alien Floristics within an Urban Matrix: The Case of Durban, South Africa

Citation: Invasive alien plant species (IAPs) represent a major threat to biodiversity globally. Minoli's study investigated the ecophysiology of IAPs within cities, using Durban as a case study. Her multidisciplinary approach combined spatial techniques, vegetation ecology, invasion biology and seed biochemistry to generate a framework for assessing IAPs within urban areas. The study's contributions to invasion biology force us to relook at how we deal with Aliens in the City.

Supervisors: Dr S Ramdhani and Professor S Naidoo

Armoed, Zakheeya, BSc(PropDev), BScHons(PropDev)(QS), MSc(ConstMgt)..... Construction Management

Thesis: A Model for the Successful Completion of Public Sector Construction and Engineering Projects in South Africa

Citation: Delays and disruptions have become endemic to the construction and engineering industry. This study examined delays, disruptions and strategies through six constructs and 38 factors resulting in the development of a Strategic Infrastructure Delivery Management Model for implementation by public sector institutions and key industry stakeholders, through the integrated of advanced technological software programs that reflect the five essential constructs and associated factors identified through extensive structural equation modelling.

Supervisor: Professor TC Haupt

Babalola, Anthony Ayotunde, BSc(ULagos), MSc(ULagos).....Construction Management

Thesis: A Policy Framework for the Implementation of Sustainable Construction in Nigeria

Citation: The uptake of sustainable construction practice in developing countries faced numerous challenges. This study developed a policy framework for implementation of sustainable construction practice in Nigeria. The model lays a foundation for policy development and industry transition towards sustainable construction. The findings have practical, academic and methodological contributions to evolving body of knowledge in the area of policy development for sustainable construction practice specifically in the context of developing countries.

Supervisor: Professor N Harinarain

Bharuth, Vishal Behary Lal, BSc, BMedScHons.....Biology

Thesis: Responses to Chilling and Cryopreservation of Recalcitrant Seeds of *Ekebergia capensis* from Different Provenances

Citation: Some plants produced so called "recalcitrant seeds" that cannot dry out and be stored in conventional seed banks. Vishal Bharuth's doctoral research focused on recalcitrant seeds from the cape ash tree (*Ekebergia capensis*). An exciting discovery was that it is possible to use an electrolysed form of calcium magnesium solution (cathodic water) to cryopreserve the seed's embryonic axes, which will enable preservation of the germplasm of this species.

Supervisors: Professor RP Beckett and Professor NW Pammenter

Calitz, Johannes Pieter, BScEng.....Agricultural Engineering

Thesis: Development and assessment of Regionalised Approches to Design Flood Estimation in South Africa

Citation: Mr Calitz's study has made significant improvements to the estimation of design floods required for the design of hydraulic structures in South Africa.

He identified the most suitable frequency distributions to use and applied new multi-variate regionalisation approaches. One of the key contributions was the development and performance assessment of four design flood estimation models at multiple scales which will have a significant impact on design flood estimation in practice.

Supervisors: Professor JC Smithers and Mr TR Kjeldsen

Camilo, Samuel Alves Silima, BScHons(UCathEastAfrica), MSc(Penn StateU)Crop Science

Thesis: Physiological Analysis of Responses of Lateral Branching of the Primary Root for Tolerance to Phosphorus Stress and Drought in the Common Bean (*Phaseolus vulgaris* L.)

Citation: Drought stress and phosphorus (P) deficiency limit common bean production under smallholder farming systems. Samuel demonstrated that an increased taproot lateral branching and length under drought stress contributes to good plant performance. Genotypes that combined this root characteristic with high grain yield under low P and drought, were selected as parents for phosphorus-use efficiency and drought tolerance breeding in common bean. The study was financially supported by APPSA and AGRA.

Supervisors: Professor J Sibiyi and Professor AO Odindo

Chamdimba, Owen Yoram, BSc(UMalawi), MSc(UMalawi)Agricultural Economics

Thesis: An Economic Analysis of Smallholders' Heterogeneity and the Impact of *Jatropha curcas* Cultivation on Household Welfare in the Mangochi District, Malawi

Citation: The study examined welfare benefits from *Jatropha curcas* production in southern Malawi, analysed smallholders' heterogeneity, determinants of resilience to food insecurity and the impact of *Jatropha curcas* cultivation. It generated various smallholder typologies, factors that influence food insecurity and the household welfare policy implications thereof. Three papers were submitted to accredited journals of which two have been published while one is under review. One paper was presented at a conference.

Supervisors: Professor GF Ortmann and Professor EW Zegeye

Dhlakama, Hilda, BScHons(UZim), MSc(NUSTZim) Statistics

Thesis: Modeling Risk Factors of TB Infection Data with Repeated Measurements in South Africa: A Comparison of Various Predictive Models.

Citation: Hilda Dhlakama holds a BSc Honours in Statistics and an MSc in Operations Research and Statistics from the U.Z and the N.U.S.T in Zimbabwe respectively. In 2016, Hilda enrolled for her PhD studies at UKZN. The thesis focuses on application of different high-level statistical methods to TB infection panel data. This also resulted in the selection of appropriate analysis for different settings of TB including TB medication non-adherence.

Supervisors: Professor HG Mwambi and Dr S Lougey

Dirwai, Tinashe Lindel, BScHons(UZim), MScEng..... Agricultural Engineering

Thesis: Moistube Irrigation Characterisation and Yield Response of Conalo (Brassica napus) Under Varied Moistube Irrigation

Citation: Given the need to use water effectively in irrigated agriculture, Mr Dirwai investigated the characteristics of a new irrigation technology, moistube irrigation, its response to negative pressure, its performance when irrigating with effluents, its wetting geometry in heavy and light textured soils and the response of an industrial crop, canola, to moistube irrigation. The study concludes that moistube irrigation technology holds significant potential to improve water productivity in irrigated agriculture.

Supervisors: Dr A Senzanje and Professor T Mabhaudhi

Dzomba, Edgar Farai, BScAgricHons(UZim), Master of Science(UZim) Animal Science

Thesis: Genetic Diversity and Differentiation of Pelt, Mutton and Wool Sheep Breeds of South Africa using Genome-Wide Single Nucleotide Polymorphisms

Citation: Edgar Dzomba developed a thesis to determine the genetic diversity and differentiation of South African sheep breeds. He used the state-of-the art genome-wide single nucleotide polymorphisms. He has published three papers in highly regard journals in the Genetics. All three examiners indicated that the thesis is well-written and the findings will contribute immensely to the expansion of the sheep industry in South Africa.

Supervisor: Professor M Chimonyo

Francisco, Bento Filipe, BScHons(CatholicUMZ), MSc(UMalawi) Plant Breeding

Thesis: Morphological and Molecular Analysis of Genetic Diversity and Marker-Trait Associations of Tomato (*Solanum lycopersicum*) in Mozambique

Citation: Biotic and abiotic stresses coupled with overdependence on seed imports due to lack of a breeding programme, threaten tomato production in Mozambique. Bento uniquely combined participatory research, SNP markers and agro-morphological traits to select genetically diverse tomato genotypes. New potential sources of useful alleles for different traits and a core collection of tomato germplasm to initiate a breeding programme were identified. The study was financially supported by APPSA and AGRA.

Supervisor: Professor J Sibiya

Fritsch, Camille Jacques-Armand, BA(UCalifornia) Ecological Sciences

Thesis: Aspects of Common Hippopotamus (*Hippopotamus amphibius*) Behavioural Ecology and their Consequences in Managed Systems in South Africa

Citation: The common hippopotamus or hippo is one of Africa's most iconic mammalian species. Hippos play an important and understudied role as ecosystem engineers in their environment, both on land and water. Mr Fritsch used novel drone technology and radiotracking to obtain ecological and behavioural

data on hippos. Understanding the environmental requirements and drivers of space-use of hippos are important for their conservation, especially with climate change and loss of habitat.

Supervisor: Professor CT Downs

Gbadega, Peter Anuoluwapo, *BScEng(ULagos), MScEng.....Electrical Engineering*

Thesis: The Adaptive Model Predictive Control of Renewable Energy-Based Micro-Grid

Citation: Performances of micro-grids used as a case study are evaluated through simulation modelling, implemented in MATLAB/Simulink environment, and the simulation results show the accuracy and efficiency of the proposed control techniques that demonstrates the effectiveness of AMPC can adapt to various generation scenarios, providing an optimal solution to power-sharing among the Distributed Energy Resources.

Supervisor: Professor AK Saha

Gbadeyan, Oluwatoyin Joseph, *BScEng(KwaraStatePoly), MScEng(DUT)Mechanical Engineering*

Thesis: Hybrid Nanoshell Reinforced Plant Fiber Biocomposite

Citation: Investigated the production of bio-based composites and nanocomposites. This is referred to as biocomposites and is vital to mitigate problems caused by the production processes and techniques, limited recyclability and end-of-life disposal of synthetic fiber-reinforced composites. The work demonstrated that waste snail shells can be beneficiated via the production of hybrid biocomposite materials incorporated with nanoparticles generated from the shells. Research study also produced 6 publications in high impact journals.

Supervisors: Professor G Bright and Professor S Adali

Gyamfi-Ampadu, Enoch, *BSc(KNUST), MSc(Bangor University)Environmental Science*

Thesis: Mapping Natural Forest Cover, Trees Species Diversity and Carbon Stocks of a Subtropical Afromontane Forest Using Remote Sensing

Citation: Natural forests have been under threat due to climate change, invasive species, and human factors such as deforestation. Adequate spatial and temporal information of natural forest structural characteristics is vital to support sustainable forest management. Hence, this study articulates the use of Satellite Remote Sensing for mapping the forest structural characteristics, coverage extent, and species diversity of the sub-tropical Afromontane Nkandla Forest Reserve for sustainable forest management.

Supervisor: Dr M Gebreslasie

Hlongwane, Zabentungwa Thakasile, *BSc, BScHons, MSc..... Ecological Sciences*

Thesis: Diversity of Edible Insects and their Related Indigenous Knowledge: Evidence from KwaZulu-Natal and Limpopo provinces, South Africa

Citation: Zabentungwa studied the indigenous use of edible insects as food, and their nutritional, economic and cultural benefits. Entomophagy is an essential traditional practice with a vital role in improving diets and sustaining rural livelihoods and wellbeing, especially in Limpopo. However, there is notable decline in entomophagy in KwaZulu-Natal. She identified broad benefits of harvesting, marketing, and consuming insects, encourages using insects as food, and highlighted policy interventions to promote this.

Supervisors: Dr TC Munyai and Professor RH Slotow

Hurisa, Kidane Tumsa, BSc(Makelle University), MSc(HaramayaU)..... Plant Breeding

Thesis: Breeding of Common Bacterial Blight Resistance in Common Bean (*Phaseolus vulgaris* L.) in Ethiopia

Citation: The common bacterial blight disease causes significant yield loss varying from 20 to 100% in susceptible common bean varieties in Ethiopia. The candidate developed common bacterial blight resistant lines and identified associated novel genes for further analysis and cultivar release. From this study two scientific papers were published in high impact journals. The study was financially supported by the International Center for Tropical Agriculture through Tropical Legume-III project.

Supervisor: Professor HA Shimelis

Ige, Oluwafemi Ezekiel, MScEng..... Mechanical Engineering

Thesis: Researchm Develepment and Testing of Brake Pad Material from Biomass Based Nancomposites

Citation: A novel bio-based hybrid nanocomposite (BHN) brake pad has been developed and investigated to serve as functional replacement for metallic, ceramic, and hazardous asbestos-based brake-pad materials. Results: BHN brake pads exhibited low wear rate; Coefficient of friction 0.3 to 0.5 within SAE J661 CODE standard; higher impact strength and compressive strength; thermal stability are within range 300 °C to 400 °C; Excellent mechanical and tribological properties.

Supervisor: Professor FL Inambao

Jaiyeola, Adesoji Tunbonsun, BHons(Ulbadan), MEng(DUT)..... Construction Management

Thesis: Development of Assessment Design Model for Inquiry Based Learning Pedagogy in Construction Education in South Africa

Citation: In order to improve quality and employability of construction graduates, construction education is shifting towards inquiry-based learning. This study developed an inquiry-based learning assessment framework for construction programmes that integrates theories of learning and inquiry-based learning pedagogy to construction practice and learning. The assessment model provides a foundation for policymakers, lecturers, curriculum developers,

and other stakeholders to improve the quality of education in construction education by developing practical assessment tools.

Supervisors: Professor N Harinarain and Professor TC Haupt

Khumalo, Mduduzi Blessing, *BSc(UOVS), MSc(TULib)*..... *Chemical Engineering*

Thesis: Valorisation of Waste Chicken Feathers: Regenerated of Keratin Fibre into Tubular Nanafibres via Electrospinning

Citation: Mduduzi Blessing Khumalo's PhD study focused on beneficiation of waste chicken feathers to produce tubular keratin nanofibres. Mdu's research developed an efficient chemical method to extract keratin from chicken feathers and then produced a mathematical model that was used to predict the yield of keratin from the extraction process. He then used an electrospinning technique to create keratin tubular nanofibres, which are proposed to be used as nerve regeneration conduits.

Supervisors: Professor BB Sithole and Professor D Ramjugernath

Malinga, Nduduzo Nkanyiso, *BSc, MSc(URhodes)*..... *Electrical Engineering*

Thesis: Synthesis and Characterisation of Magnetic Graphene-Nanoparticle Composites for Water Purification

Citation: Graphene is a one carbon atom thick nanomaterial, with a massive surface area of 2629 m²/gram. Adsorption refers to molecules gathering on a surface. A version of graphene, graphene oxide, was synthesised and modified into different magnetic composites, all with a large surface area which effectively adsorbed toxic molecules, a pollutant, from water. The composite was removed from the water with a magnet completing the water purification process.

Supervisor: Dr ALL Jarvis

Maroa, Samwel Semakula, *BTech (UEastern Africa), MScEng*..... *Mechanical Engineering*

Thesis: Effect of Pyrolyzed Municipal Solid Waste Feedstocks as Energy Sources for Non-Road Diesel Engine, Combustion, Performance and Emissions Characteristics Using Biodiesel Blended Ratios

Citation: The study focuses on blending strategies by using waste feedstocks to improve poor chemical properties. The study shows increased Brake Thermal Efficiency; good fuel economy and consumption; marginally decrease smoke emissions; increase in NOX emissions and exhaust temperatures with increase in blend ratios. This work shows that waste municipal solids have high potential as a sustainable feedstock for the production of biodiesel for diesel engines.

Supervisor: Professor FL Inambao

Mathebula, Vonani Clive, BScEng, MScEng *Electrical Engineering*

Thesis: Reliability of Multi-Channel IEC 61850 Mission-Critical Substation Communication Networks Based on Markov Process Incorporating Linear Dynamical Systems and Calculus Inferences

Citation: Reliability of a repairable multi-channel IEC 61850 based SCN architecture is modelled using a structure-function and the Markov process while Systems Thinking integrates imperfect repair factors into the model. A novel eigenvalue analysis method based on Markov partitions and symbolic dynamics in the context of linear dynamical systems is used to investigate the impact of imperfect repairs on system's reliability based on number of mean state transitions and dynamical behaviour.

Supervisor: Professor AK Saha

Mboya, Innocent Baltazar, BA(USokoine), MSc(Kilimanjaro) *Statistics*

Thesis: Joint Predictors of Preterm Birth and Perinatal Death among Singleton Births at a Zonal Referral Hospital in Northern Tanzania: A Birth Registry-based study from 2000 to 2017

Citation: The dissertation focussed on joint modelling of two outcomes, premature delivery and perinatal mortality using hospital delivery data collected over a long period of time in Northern Tanzania. Novel statistical methods including missing data algorithms were used to increase precision of estimates relating joint risk factors to the two outcomes. Three papers have already been published in reputable ISI journals and the fourth under final revisions.

Supervisors: Professor HG Mwambi, Professor MJ Mahande and Dr JJ Obure

Mburu, Zachariah Mbugua, BScHons(JKUAT), MSc(JKUAT) *Applied Mathematics*

Thesis: A Numerical Study of Entropy Generation in Nanofluid Flow in Different Flow Geometries

Citation: The focus was on the development of new spectral solution techniques for nonlinear boundary value problems modeling non-Newtonian fluid flows. The efficiency and accuracy of the methods was proven. The major factors affecting the rate of entropy generation and the flow properties were investigated. Findings are that the rate of entropy production and the fluid flow properties can be controlled through a careful selection of physical and fluid parameters.

Supervisor: Professor P Sibanda

Mkololo, Thumeka, BSc(UFH), BScHons(UFH), MSc *Chemistry*

Thesis: Study on Stratospheric-Tropospheric Ozone and Its Exchange, Including Total Column- and Surface-Ozone Variations Using Ground-Based and Satellite Observations in South African Sites.

Citation: This Study Quantifies This Surface-, Total Column- and Exchange between Stratosphere and Troposphere Ozone Concentrations over Different Places in South Africa (Especially over Irene and Western Cape), using both Ground Based and Space-Borne Observations. Study has Already Resulted into a Reputed Journal Articles and Few Peer Reviewed Conference Proceedings.

Supervisor: Professor S Venkataraman

Mndzebele, Buhlebelive Mgcini Melusi Phwayinkosi, *BScAgric(UNISWA), MTech(TUT)*.....
Crop Science

Thesis: Yield and Nutritional Benefits of Cowpea-amaranth Intercropping Systems in Varying Fertilization Levels

Citation: One of the major challenges of agriculture is linked to the diminishing natural resources under climate change. This study demonstrated how underutilised nutrient rich crops, Amaranthus and cowpeas, can have high yields under suboptimal fertiliser conditions, while improving soil health. The economically valuable components of the crops were shown to be high in content, so that the crops can be easily integrated into a successful sustainable agriculture system.

Supervisors: Professor AT Modi, Professor T Mabhaudhi and Dr B Ncube

Mohammed, Ali Alhafiz, *PGDip(FUTA), MEng(FUTA)*..... Chemical Engineering

Thesis: Mass Transfer Enhancement in a Falling Film Micro-reactor Through the Application of a Centrifugal Field

Citation: Ali Mohammed's study involved the theoretical and experimental investigation of the enhancement of mass transfer in a gas-liquid microreactor through the application of centrifugal force. He demonstrated that angular rotation of a microstructured device results in spreading and thinning of the liquid film that forms within the microchannels, and that the reduced diffusive and conductive path length results in higher rates of mass transfer into and through the liquid film.

Supervisor: Professor D Lokhat

Moyo, Mehluli, *BSc(Agric), MSc(Agric)*..... Animal Science

Thesis: Modelling of Feeding Behaviour, Rumen Load and the Kinetics of Digestion and Passage of Digesta in Domestic and Wild Ruminants

Citation: Roughage intake is affected by factors including feeding behaviour, the weight of rumen matter and its clearance rates. Using the Artificial Neural Networks and The Random Forest procedures, he developed models of feeding behaviour, rumen load and the kinetics of digestion and passage in domestic and wild ruminants. Parts of these models have attracted attention from many a ruminant researcher around the globe.

Supervisor: Professor IV Nsahlai

Muoka, Alexander Kasyoki, *BScHons(JKUAT), MSc(JKUAT)* *Statistics*

Thesis: Statistical Methods to Correct for Covariate Measurement Error in Observational Studies

Citation: The thesis makes novel contributions in covariate error measurement modelling, which includes regression calibration and generalized estimating equations. These models are extended to the case of multiple covariates measured with error by combining measured covariate data with external validation data. The work applies real and simulated data. Methodological development and applications are the key features of the work. Two papers are published, one submitted and a fourth one under preparation.

Supervisors: Professor HG Mwambi, Dr O Ngesa and Dr GO Agogo

Ndlela, Sithembile Zenith, *BTech(DUT), MSc(Agric)* *Animal Science*

Thesis: Utilisation of Indigenous Knowledge to Mitigate Challenges of Gastrointestinal Nematodes in Goats

Citation: The study investigated indigenous knowledge methods used to control nematodes to improve goat productivity. Thirty-three plant species were identified, and farmers used different plant forms and extraction methods based on their availability and knowledge. Most plant extracts were not influenced by concentrations. However, quadratic relationships in other plant extracts suggested that concentrations with high larvae mortality could be adopted. The study produced 2 journal articles and a conference presentation.

Supervisor: Professor M Chimonyo

Ndlovu, Phindile Faith, *BSc(Agric), MSc(Agric)* *Horticultural Science*

Thesis: Rapid Monitoring and Quantification of Unripe Banana Flour Adulteration using Visible - Near Infrared Spectroscopy

Citation: Banana flour is premium gluten-free with high proportions of resistant starch. Phindile Ndlovu's study developed spectroscopic models for rapidly detecting and quantifying food fraud by adding cheap wheat and maize flour to high-value banana flour. Her thesis further identified biomarkers that could be used to discriminate banana flour adulteration at different concentration levels. Her four research chapters were published in high-impact factor journals.

Supervisors: Professor LS Magwaza and Professor SZ Tesfay

Ngcobo, Makhosonke, *BSc, BScHons, MSc* *Chemistry*

Thesis: Structural and Ethylene Oligomerization Studies of Homogeneous and Immobilized N⁺O-Donor Iron(II), Nickel(II) and Cobalt(II) Catalysts

Citation: Mr Makhosonke Ngcobo obtained his BSc, Hons and MSc degrees in Chemistry from the University of KwaZulu-Natal. He then continued with PhD

studies working on the design of immobilized transition metal complexes as recyclable catalysts for the transformation of abundant South African olefins to valuable products such as detergents and surfactants. The candidate has published two articles in international journals, while two manuscripts are under preparation.

Supervisor: Professor SO Ojwach

Nhleko, Melusi Velolwenkosi, BScEng, MBA(Regent BS)..... Mechanical Engineering

Thesis: Designing a Photovoltaic-Microbail Fuel Cell (PV-MFC) Renewable Hybrid System Based on Public- Private Partnership and other South African's Policies: A Case Study Umhlathuze Municipality

Citation: This study contributes to pre-treatment process that uMhlathuze municipality can use to improve PV-MFC performances. There are leadership gaps and limited strides aimed by government at resolving the energy challenges faced by municipalities in delivering affordable services to communities without the uncertainties of energy shortages. Study shows how municipal infrastructure maintenance actions and procurement of energy has on the affordability of citizens.

Supervisor: Professor FL Inambao

Ojako, Samson Ogagaoghene, BScHons(AmbroseAlliU), MSc..... Applied Mathematics

Thesis: Conformal Symmetries in Spacetimes with Type I and Type II Matter Fields.

Citation: This study is devoted gravitational collapse with symmetries in spacetimes with physically acceptable matter fields. The conformal symmetry vectors are generated in generalized Vaidya geometry which describes the exterior of stars. In the vicinity of the central singularity the spacetime becomes almost self-similar. This study supports earlier numerical treatments for massless scalar field collapse and provides an analytic basis for the study of critical phenomena in collapse processes.

Supervisors: Professor SD Maharaj and Professor R Goswami

Oladoyinbo, Segun Emmanuel, BEng(Ullorin), MScEng..... Electronic Engineering

Thesis: Index Modulation for Next-Generation Wireless Networks

Citation: In his thesis, Mr Oladoyinbo investigated several innovative modulation schemes or communication methods for fifth generation networks and beyond. The schemes/methods consider to address some of the major challenges in the wireless communications area, for example, increased communication reliability and data rates, while minimizing the impact on processing hardware. Two journal articles and two conference papers have emanated from his work.

Supervisors: Dr N Pillay and Professor H Xu

Omoareloje, Luke Odianose, *BScHons(OAU), MSc(OAU)* *Botany*

Thesis: Strigolactone Hormonal Actions in Plant Tolerance to Heat and Chilling Stress, Adventitious Root Development, and Seedling De-etiolation

Citation: Mr Omoareloje investigated a little-known class of plant growth regulators, strigolactones. He focused on strigolactone hormonal actions as a plant's response and defense against oxidative damage induced by temperature, targets to down-regulate root formation and involvement of strigolactones in pigment accumulation during de-etiolation. Luke's drive and insight resulted in a brilliant thesis, awarded without corrections. He has published five papers in highly rated journals, a testament to a gifted scientist.

Supervisors: Professor J Van Staden, Professor JF Finnie and Dr M Kulkarni

Omondi, Reinner Ochola, *BScHons(MasenoU), MSc* *Chemistry*

Thesis: Tuning the Steric and Electronic Parameters of Mixed-Donor Palladium(II) Complexes: Coordination Chemistry, Substitution Kinetics and Biological Activities

Citation: Mr Reinner Omondi obtained his BSc(Hons) and MSc (Chemistry) degrees from Maseno University (Kenya) and University of KwaZulu-Natal respectively. His PhD thesis encompassed a complex multi- and inter-disciplinary study, seeking to understand how the coordination behavior and kinetic reactivity of palladium(II) complexes control their anti-cancer activities. Three articles have been published in high impact factor journals, while another two are undergoing review.

Supervisor: Professor SO Ojwach

Omotola, Elizabeth Oyinkansola, *MSc(Ulbadan)* *Chemistry*

Thesis: Environmental Monitoring and Ecotoxicity Studies of Selected Pharmaceutical Compounds in Some Surface Waters Around KwaZulu-Natal Province, South Africa.

Citation: Elizabeth monitored some pharmaceutical compounds (PHACs) in surface waters, and investigated the diverse toxicities they posed to non-target organisms in the aquatic ecosystem. Ecological monitoring, ecotoxicity and endocrine disruption (EDC) studies were conducted in UKZN; CSIR, Stellenbosch, and University of Pretoria. Currently, her work is the first systematic studies to highlight toxicological effects of lamivudine in freshwater aquatic ecosystem. Findings from this studies have been published, with others being peer reviewed.

Supervisor: Dr OS Olatunji

Oni, Oluwafemi Emmanuel, BEng(UAdo-Ekiti), MScEng.....Electrical Engineering

Thesis: Stability of the Grid Incorporating Multi Terminal HVDC: Case Study a South African Network

Citation: Oluwafemi Emmanuel Oni investigated how a Multiterminal HVDC system could be integrated into the South African network, where there is a need to transmit power over long distances. The thesis showed that the integration of the MTDC system assists the grid by damping the transients under fault conditions while maintaining the power delivered. He showed this through a number of journal papers.

Supervisors: Dr AG Swanson and Dr R Pillay Carpanen

Onyando, Francis Collins Muga, BSc(UNairobi), MScEng Agricultural Engineering

Thesis: Modelling the Infrared Assisted Hot Air Drying of Beef for Biltong Production

Citation: Mr Onyando characterised the drying of beef biltong using hot air and infrared assisted hot air-drying methods. His research developed a heat and mass transfer model and a thermodynamic model for simulating the drying of beef biltong processed using infrared assisted hot air-drying. The mechanistic models are useful in optimizing the drying of biltong. Moreover, the models provide a scientifically sound basis for applying infrared in the processing of biltong.

Supervisors: Professor TS Workneh and Dr MO Marenja

Oyetunde-Joshua, Funsho Mary, BSc(AmbroseAlliU), MSc(Ulbadan) Chemistry

Thesis: Phytochemical Investigation and Biological Studies Of some South African Plant Species (Asteraceae and Hyacinthaceae).

Citation: Funsho investigated the medicinal benefits of *Scilla nervosa*, *Helichrysum panduratum* and *Helichrysum actutaum*. This is the first report of lanostane-triterpenes and homoisoflavonoids from *S. nervosa* and *H. panduratum* respectively. A high yield of α -arbutin, a tyrosinase inhibitor, was obtained from the leaves of *H. panduratum*. This study is the first phytochemical report and scientific justification for the traditional use of *H. acutatum*, which is due to its potent antioxidant activity.

Supervisor: Professor R Moodley

Phali, Lerato Eunice, BSc(Agric), MSc(Agric).....Agricultural Economics

Thesis: Evaluation of Institutional Integration, Farmer Participation and Performance in Smallholder Irrigation Schemes in KwaZulu-Natal, South Africa

Citation: Lerato Phali looked at institutional integration in the governance of smallholder irrigation schemes. She evaluated farmers' participation scheme management and their perceptions of governance. Her findings provide guidance to policymakers and stakeholders involved in irrigation schemes on the need

for institutional integration. The study recommends the inclusion of informal institutions in the formulation of irrigation management policies. This work produced two journal articles and was presented at two international conferences.

Supervisors: Professor M Mudhara, Dr SRD Ferrer and Professor G Makombe

Pisa, Charity, *BScAgric(Hons)(UZim), MSc(UZim)* *Soil Science*

Thesis: Composting Performance of Vermiculite-cattle Manure Composts and their Effects on Selected Soil Properties and Maize (*Zea mays* L.) Production on Sandy Loam Soils in Zimbabwe

Citation: Soil fertility is a major constraint for crop productivity in sub-Saharan Africa, and improvements through compost application are limited by nitrogen (N) loss during composting. Charity found that vermiculite inclusion, at 20 and 30%, improved N retention, in cattle manure compost, fertility and moisture of amended sandy loam soils, and maize yield, under field conditions. Incorporation of vermiculite during composting of cattle improves compost quality, soil fertility and crop yields.

Supervisors: Professor P Muchaonyerwa and Professor M Wuta

Pule, Hosiah Turupa, *BScAgric(NWU), BScAgricHons(NWU), MAgricSci(UPret)* *Botany*

Thesis: The Causes and Consequences of *Seriphium plumosum* L. Encroachment in Semi-arid Grassland Communities of Gauteng Province, South Africa

Citation: Woody plant encroachment is widespread in grassland and savanna ecosystems of the world. Hosia investigated the complex interaction of environmental factors responsible for *Seriphium plumosum* L. encroachment in the semi-arid grasslands. He found that *S. plumosum* encroachment tends to occur on overgrazed or burned, well-drained poor soils, accelerating rangeland degradation. His study suggested opportunities to integrate fire, browsers and forage supplements in managing *S. plumosum* encroachment.

Supervisors: Dr MJ Tedder and Dr TJ Tjelele

Rajah, Christopher Bradley, *BSc, BScHons(UNISA), MSc(UWC)* *Computer Science*

Thesis: Structure Based Partial Solution Search for the Examination Timetabling Problem

Citation: The graduand introduced a new search approach for solving the examination timetabling problem, namely, the structure based partial solution search (SBPSS). The novelty of the research includes that the search is directed by both structure and performance and the space of partial solutions is incrementally explored. The SBPSS was applied to three known benchmarks comprising real world examination timetabling problems for which it produced a number of best results.

Supervisor: Professor N Pillay

Raji, Islamiat Abidemi, *BScHons(Ullorin), MSc(UJos)*..... *Ecological Sciences*

Thesis: Effects of Land-use Changes on the Distribution and Use of *Ficus* Species by Frugivores in the Urban Mosaic Landscape of Durban, KwaZulu-Natal, South Africa

Citation: Globally, patches of natural ecosystem pose vital refugia for biodiversity in anthropogenic landscapes. It is essential to understand how organisms persist in these anthropogenic landscapes. Ms Raji investigated the diversity, distribution and phenology of *Ficus* species and their interactions with vertebrate seed dispersers in the urban mosaic landscape of eThekweni. She showed the importance of indigenous figs as key fruit resources for vertebrate persistence and their role in seed dispersal.

Supervisor: Professor CT Downs

Rezenom, Seare Haile, *BScEng(UZim), MScEng*.....*Electronic Engineering*

Thesis: Iterative Graphical Algorithms for Phase Noise Channels

Citation: This thesis proposes algorithms based on graphical models to detect signals and characterise the performance of communication systems in the presence of Wiener phase noise. The algorithms exploit properties of phase noise and consequently use graphical models to develop low complexity approaches of signal detection.

Supervisors: Professor F Takawira and Professor SH Mnene

Roopchand, Rishen, *BScEng, MScEng*..... *Chemical Engineering*

Thesis: Development of Nano-crystalline Cellulose (NCC) applications and subsequent production process design/up-scaling.

Citation: This study addressed two main problems currently limiting the development of a South African bioeconomy: the absence of pilot and commercial-scale facilities to produce cellulose nanocrystals, and the lack of high-impact cellulose nanocrystals applications in commercial products. Therefore, Rishen worked on a design of up-scaled cellulose nanocrystals production facilities from waste biomass and the application of cellulose nanocrystals in novel green construction materials incorporating fly ash wastes.

Supervisor: Professor BB Sithole

Salau, Veronica Folakemi, *BSc(FederalUTech), MSc(Ulbadan)*.....*Biochemistry*

Thesis: Mechanisms Behind the Antidiabetic Effects of Some Selected Phenolics in Type 2 Diabetes and Some of its Associated Complications

Citation: Diabetes is one of major global public health problems. In this thesis, the candidate made an outstanding and novel contribution in the area of alternative medicine and type 2 diabetes by using several pure compounds which will help to develop natural and new generation anti-diabetic

medicines with fewer or no side effect. She has also published 11 papers from her thesis when some others to come in the following days.

Supervisor: Professor MS Islam

Shaik Abdool, Faiaz, *BSc, BScHons, MSc*.....*Biochemistry*

Thesis: Molecular Cloning, Recombinant Expression, Purification and Characterisation of Two Serine Proteases and a Serine Protease Inhibitor from *Trichinella zimbabwensis* as Potential Diagnostic Antigens for Trichinellosis

Citation: Faiaz Shaik Abdool discovered serine proteases and a serpin in *Trichinella zimbabwensis* (intramuscular nematode reptiles and mammals). He cloned and recombinantly expressed protease and serpin coding genes; produced specific antibodies. Faiaz showed TzChSP protease digests matrix proteins for muscle invasion and TzSerpine inhibits mammalian serine proteases for nematode survival in host gut. He used TzProteases and TzSerpine in ELISA to detect IgG in infected animal sera, laying groundwork for diagnostics.

Supervisor: Professor THT Coetzer

Shivambu, Ndivhuwo, *BSc(UVenda), BScHons(UVenda), MSc(UPret)**Zoology*

Thesis: Assessing the Risk of Non-native Small Mammals in the South African Pet Trade

Citation: The pet trade is one of the main invasion pathways for some small mammals through accidental escapes and intentional releases of pets. Ms Shivambu examined the potential invasion risks associated with the non-native pet trade in South Africa with a specific focus on mammals. She used multiple different quantitative techniques to determine the existing and potential invasion risks associated with the pet trade and which interventions might mitigate these risks.

Supervisor: Professor CT Downs

Shivambu, Tinyiko Cavin, *BSc(UVenda), BScHons(UVenda), MSc(UPret)*.....*Zoology*

Thesis: Aspects of the Ecology of Invasive Rose-ringed Parakeets (*Psittacula krameri*) in eThekweni Metropolitan, KwaZulu-Natal Province, South Africa

Citation: Globally rose-ringed parakeets are a highly successful invasive bird species. They typically negatively impact indigenous fauna and flora in their invasive range. To show their impacts, Mr Shivambu studied the distribution and ecology of rose-ringed parakeets in eThekweni Metropolitan, KwaZulu-Natal Province. He used a combination of applied ecology and socio-ecological management to propose appropriate and highly relevant management. He has five thesis chapters published in leading international peer-reviewed journals.

Supervisor: Professor CT Downs

Singh, Shalin, BSc, BScHons, MSc.....Mathematics

Thesis: Some Aspects of Localic Semigroups.

Citation: Mr Singh did his research on localic semigroups, i.e. semigroup objects in the category of locales. Shalin was the first to initiate such a study within the theory of locales. All the examiners made special mention of this, as well as saying that he had obtained a number of noteworthy and important results in this new area of research. He was supervised by Professor P Pillay and Professor D Baboolal.

Supervisors: Professor P Pillay and Professor D Baboolal

Sitabule, Namadzavho Enos, BSc(Vista), BScHons(Wits), MSc(Wits), BScHons(UPret).....Chemical Engineering

Thesis: Evaluation of Foward Osmosis Technology for the Treatments of Concentrated Brines

Citation: Enos Sitabule conducted a techno-evaluation of Forward Osmosis of brine streams at Sasol. Disposal of these brines are a significant environmental challenge. Forward osmosis is a relatively new separation process that draws water through a membrane to a concentrated draw solution that can be regenerated. Critical performance parameters were evaluated. The study provided new information on the interaction of the components of the draw solution with the feed water.

Supervisor: Professor CA Buckley

Tembe, Danisile, BSc, BScHons, MSc.....Genetics

Thesis: Identification of Arthropods of Forensic Importance During Cold and Warm Seasons in KwaZulu-Natal Province of South Africa

Citation: Ms Danisile Tembe undertook a novel study on the "Identification of arthropods of forensic importance during cold and warm seasons in KwaZulu-Natal Province of South Africa". It is worth noting that there are very few studies of this nature in southern African region and the results from her study pointed to the potential of application of forensic entomology as a tool in criminal investigations and wildlife poaching in the region.

Supervisor: Professor S Mukaratirwa

Tesfamariam, Seltene Abady, BScAgric(HaramayaU), MScAgric(HaramayaU).....Plant Breeding

Thesis: Breeding Groundnut for Drought Tolerance

Citation: Groundnut farmers in Ethiopia use low yielding late maturing varieties which are vulnerable to drought stress. The candidate created new breeding populations with high yield, early maturity and drought tolerance. Three scientific papers were published from the study. The study was financially supported by the Organization of the Petroleum Exporting Countries for

International Development, International Foundation for Science and the Research Program on Grain Legume and Dry Land Cereals.
 Supervisor: Professor HA Shimelis

Theron, Genevieve Lee, *BSc(Stellu)*, *BScHons(Stellu)*, *MSc(Stellu)*..... *Ecological Sciences*

Thesis: Evolution of Tangle-veined Flies: Systematics, Biogeography and Functional Traits in Southern African Nemestrininae (Nemestrinidae)

Citation: Genevieve Theron studied a group of southern African flies that are keystone pollinators of many plant species. She reconstructed relationships among the species and used this to determine their evolution in time and space, and the origin of their extremely long nectar-sucking tongues. Her biggest discovery was that half of the studied species do not have formal scientific names, which led her to describe a new, ecologically important fly species.

Supervisors: Dr T Van Der Niet, Professor SD Johnson, Professor BC Anderson and Professor AG Ellis

Tombe, Ronald Keng'ara, *MSc(UNairobi)* *Computer Science*

Thesis: Adaptive Feature Characterization for Remote Sensing Image Scene Classification.

Citation: Remote sensing images are a valuable source of data that can be utilized to determine and visualize detailed information on the Earth cover with the aid of computer algorithms that can effectively extract and interpret these image data. Ronald Keng'ara Tombe explored Machine Learning techniques that are effective for characterizing the complex semantics of remote sensing images.

Supervisor: Professor S Viriri

MASTERS DEGREES

Master of Agriculture

Malinga, Simangaliso Talent *Agricultural Ext And Rural Resource Mngt*

Dissertation: Impact of Livestock Theft on Rural Livelihoods in Kwadlangezwa, Kwazulu-Natal

Supervisor: Professor SH Worth

Naicker, Merishca *Food Security*

Dissertation: An Evaluation of Climate Change Effect on Community Gardens Crop Production Aimed at Enhancing Household Food Security in Dlangenzwa, Umdoni Municipality

Supervisors: Mr K Naidoo and Dr MSC Ngidi

Shabangu, Thembalakhe Decent..... *Agricultural Ext And Rural Resource Mngt*
 Dissertation: The Impact of Recapitalization and Development Program on the Performance
 of Land Reform Farmers in the Province of KwaZulu-Natal
 Supervisors: Dr MSC Ngidi and Mr T O Ojo

Master of Science

* **Abdullah**, Shabaaz..... *Chemistry*
 Dissertation: Coordination Behaviours of multidentate Ndonor Schiff bases and Heterocyclics
 towards the *fac* -[Re(X)3] + (X = CO or O) cores
 Supervisor: Professor IN Booysen

Aruleba, Idowu Thomas..... *Computer Science*
 Dissertation: Deep Learning for Age Estimation using EfficientNet.
 Supervisor: Professor S Viriri

Awuah, Akosua Kyerewaa *Geography*
 Dissertation: Exploring the Implementation of Integrated Water Resources (Management
 (IWRM) and Adaptive Management (AM) at a Local scale: A Case Study of the
 uMngeni Catchment, KwaZulu-Natal
 Supervisor: Dr SI Stuart-Hill

Badenhorst, Stacey..... *Biology*
 Dissertation: Macrofauna Diversity of Unique, Fluvially-Dependent Soft-Sediments Habitats
 in the uThukela Marine Protected Area, South Africa
 Supervisor: Ms CF Mackay

Bhikraj, Kiosha..... *Genetics*
 Dissertation: Population Genetics of the Invasive Weed *Arundo donax* in South Africa
 Supervisors: Dr S Willows-Munro and Dr A Bownes

Bongoza, Unathi..... *Chemistry*
 Dissertation: Synthesis, Coordination Chemistry and Biological Activity of Formamidines
 Silver(I) Complexes.
 Supervisor: Professor BO Owaga

Bulunga, Vusi Andile..... *Applied Mathematics*
 Dissertation: Analysis of Models Arising from Heat Conduction through Fins Using Lie
 Symmetries and Tanh Method.
 Supervisor: Dr MD Mhlongo

- * **Chabalala**, Thabang Goodman *Statistics*
 Dissertation: Statistical Analysis of School Attendance Rate Among Under 20 South African Learners.
 Supervisors: Ms DJ Roberts and Professor TT Zewotir
- Chithwayo**, Aphile Eustice *Physics*
 Dissertation: The Synthesis and Characterization of Magnetic α -Fe² and α -Fe²O³ Nanoparticles
 Supervisor: Dr CJ Masina
- Duminy**, Welni *Chemistry*
 Dissertation: Synthesis and Structural Characterisation of Coinage Metal Monothiocarbonate Complexes.
 Supervisor: Professor WE Van Zyl
- Ekpe**, Wonder Kudzo *Applied Mathematics*
 Dissertation: Discontinuous Galerkin Finite Element Method for the Stokes Problem Using Rectangular Meshes.
 Supervisor: Dr K Arunakirinathar
- Essop**, Abu-Bakr *Physics*
 Dissertation: Development of Near Real Time and Cumulative GIC Proxy Indices.
 Supervisors: Dr Z Mtumela and Dr S Lotz
- Fraser**, Stephanie Anne *Chemistry*
 Dissertation: Cellulose-Based Nanocomposites Incorporating Inorganic and Polymer Components: Synthesis, and Luminescent, Electroconductive and Strain-Sensing Functionalities.
 Supervisor: Professor WE Van Zyl
- Gilmore**, Jessica Rose *Biology*
 Dissertation: Population Connectivity of *Stylophora Pistillata* and *Sinularia Brassica* Between KwaZulu-Natal Marine Protected Areas
 Supervisors: Dr DJ Pearton and Dr AHH Macdonald
- Goosen**, Magda *Ecological Sciences*
 Dissertation: Protected Area Management and Planning Challenges: Sustainability and Integrity – A Cursory Investigation of the Role of the Management Plan
 Supervisors: Professor CT Downs and Dr AC Blackmore

Gule, Londiwe Simthembile Nokwanda.....*Environmental Science*

Dissertation: Monitoring Environmental Changes on the Wetland Vegetation Following a Drought in Ntabamhlophe Vlei in the Midlands of KwaZulu-Natal

Supervisor: Dr EJJ Sieben

Gumede, Sandile Innocent.....*Statistics*

Dissertation: Factors Associated with Teenage Pregnancy in Malawi.

Supervisors: Ms DJ Roberts and Ms A Desai

Hanekom, Tanja.....*Biology*

Dissertation: Physiological Responses of a South African High-Latitude Coral Community to Global Warming

Supervisors: Dr SNP Porter and Professor MH Schleyer

Haripersad, Sumina.....*Genetics*

Dissertation: Development of Methylation-specific PCR (MSP) and Multiplex Methylation SNaPshot Assay for Efficient Identification of Human Body Fluids

Supervisors: Dr M Joshi and Dr AJ Niehaus

Headley, Annarien Gertruida.....*Applied Mathematics*

Dissertation: Using Machine Learning Techniques to Identify Strong Gravitational Lensing Systems in the Dark Energy Survey.

Supervisors: Professor MJ Hilton, Professor I Sinayskiy and Mr AW Pillay

* **Jeewa, Asad**.....*Computer Science*

Dissertation: Policy Optimisation and Generalisation for Reinforcement Learning Agents in Sparse Reward Navigation Environments.

Supervisors: Mr AW Pillay and Dr E Jembere

* **Kanniah, Deanntha**.....*Environmental Science*

Dissertation: A Systematic Review and Meta-Analysis of Solar Technology Impacts on Rural Households: Experiences from The Global South

Supervisor: Dr S Munien

Kantize, Kevin.....*Chemistry*

Dissertation: Screening of Water Pollutants using Metallophthalocyanine-based Chemically Modified Electrodes

Supervisors: Professor IN Booysen and Dr A Mambanda

- Khowa, Anele Aurelia**.....*Ecological Sciences*
 Dissertation: The Contribution of Goats to Household Food Security in Selected Communities in KwaZulu-Natal, South Africa
 Supervisors: Dr M Kraai and Dr Z Tsvuura
- Khoza, Lindiwe Rebecca**.....*Ecological Sciences*
 Dissertation: Ant Community Response to Fertilizer Application and Distribution in a Mistbelt Grassland, KwaZulu-Natal
 Supervisors: Dr TC Munyai and Professor AN Andersen
- Khuzwayo, Nomfundo**.....*Statistics*
 Dissertation: Parametric and Semi-Parametric Time-to-Event Modelling of Relapse in Breast Cancer Patients
 Supervisor: Ms JM Batidzirai
- Kisten, Dalicia**.....*Biology*
 Dissertation: Comparative Microbiome of *Amblyomma hebraeum* Tick Stages Infected and Non-infected with *Rickettsia africae*
 Supervisors: Professor S Mukaratirwa and Professor RJ Brinkerhoff
- Kuhlengisa, Linda Pumulani**.....*Biochemistry*
 Dissertation: The Determination of P-Glycoprotein Inhibition by BACE-1 Binding Compounds
 Supervisor: Dr R Hewer
- Lembede, Zinhle Nokubonga**.....*Botany*
 Dissertation: Soil Phosphorus Deficiency affects the Microbial Symbiosis, Nitrogen Nutrition, and Growth of *Vachellia nilotica* and
 Supervisors: Dr A Magadlela and Dr Z Tsvuura
- Lushaba, Londiwe Goodness**.....*Chemistry*
 Dissertation: The Synthesis and Application of Metal Oxides as Photocatalyst in Organic Reactions
 Supervisor: Professor RS Robinson
- Mailula, Raesetsa Portia**.....*Zoology*
 Dissertation: Taxonomic Revision and Red List Assessment of the 'Red Millipede' Genus *Centrobolus* (Spirobolida: Pachybolidae) of South Africa
 Supervisors: Dr TC Munyai and Professor ML Hamer

Maistry, Aleshan..... *Computer Science*

Dissertation: A Comparative Study of deep Learning Methods for the Automated Diagnosis of Diabetes Retinopathy.

Supervisors: Mr AW Pillay and Dr E Jembere

Mazibuko, Phiwokuhle Zasemangweni Phelele..... *Plant Pathology*

Dissertation: Management of *Aspergillus flavus* Link Infections in Groundnut Seeds using Hot Water Treatment and Biological Control Agents

Supervisors: Dr KS Yobo and Professor MD Laing

Mbatha, Sikhethile *Biological Sciences*

Dissertation: Effects of High Light Intensity and Desiccation Stress on Moss Species

Supervisor: Professor RP Beckett

Mkhize, Londeka..... *Physics*

Dissertation: Investigating the Relationship between Solar Storms and Galactic Cosmic Rays During Solar Minimum and Solar Maximum at Aviation Altitude.

Supervisors: Dr RR Nndanganeni, Dr Z Mtumela and Professor MJ Kosch

Mkhize, Nokwanda Lady-Fair..... *Entomology*

Dissertation: Biology, Seasonal Abundance and Host Range of Capitulum-feeding Insects Associated with the Invasive Weed *Senecio madagascariensis* (Asteraceae) in its Native Range in KwaZulu-Natal, South Africa

Supervisors: Professor T Olckers, Dr D Egli and Dr S Willows-Munro

Mkhize, Nonduduzo Noxolo *Statistics*

Dissertation: Factors Affecting Child Mortality in Lesotho using 2009 and 2014 LDHS Data

Supervisors: Professor SF Melesse, Professor S Ramroop and Professor HG Mwambi

Mkize, Onenkosi Simile..... *Geography*

Dissertation: Limited Access to Safely Managed Water in Resource-Poor Rural Contexts: A Photovoice Study of Adult Experiences in KwaZulu-Natal, South Africa

Supervisor: Mr ND Ngidi

* **Mnyandu, Hopewell Mlungisi**..... *Chemistry*

Dissertation: Methods Development and Application for Triazines Determination in Fruits and Vegetables: Comparing the Significance of Solid Phase Extraction, QuEChERS Extraction, and Ultrasonic Solvent Extraction Techniques

Supervisor: Dr PN Mahlambi

Mofolo, Selebaleng Patricia.....*Soil Science*

Dissertation: Evaluating Biological Nitrogen Fixation of Beans and Nitrogen Use Efficiency of Maize Cultivars for Improving Crop Productivity and Soil Fertility in Lesotho

Supervisors: Professor P Muchaonyerwa and Dr JJ Adu-Gyamfi

* **Mohamed**, Moinudeen.....*Applied Mathematics*

Dissertation: Star Formation in a Fat Galaxy Cluster: MeerKAT Observations of “El Gordo”.

Supervisors: Professor MJ Hilton and Dr KL Knowles

Moodley, Kameshan.....*Statistics*

Dissertation: Statistical Models to Analyse a Baseline Survey on Rural KwaZulu-Natal Adults’ HIV Prevalence and Associated Risk Factors. adults’ HIV prevalence and associated risk factors.

Supervisors: Professor TT Zewotir and Ms DJ Roberts

Msweli, Lindelwa Sibongakonke.....*Ecological Sciences*

Dissertation: Role and Effects of Southern African Ungulates on Seed Dispersal of Select Alien Invasive Fruiting Plants

Supervisors: Professor CT Downs, Dr MM Zungu and Dr CB Baltzinger

Mthembu, Phindile Prudence.....*Geography*

Dissertation: Community Perceptions on a Prospective Game Reserve: A Case Study of Loziba Wilderness, Northern KwaZulu-Natal

Supervisor: Dr AP Nel

Mthethwa, Bongumusa Comfort.....*Biochemistry*

Dissertation: Enzymatic Characterisation of a CATL-like Protease from *Trypanosoma brucei* and Small-subunit rRNA Sequence Based Phylogenetic Analysis of Freshwater Fish Trypanosomes

Supervisors: Professor THT Coetzer and Dr S Willows-Munro

Mthombathi, Zabenguni Zakithi.....*Chemistry*

Dissertation: Synthesis of Ketones through Aerobic Transition Metal-catalyzed Cross-coupling of Thioesters

Supervisor: Dr S Sithebe

Mtshali, Spindile.....*Geology*

Dissertation: Characterisation of Groundwater and Surface Water Interaction in the eThekweni Metropolitan District, KwaZulu-Natal, South Africa

Supervisor: Dr MB Demlie

Mungar, Aviksha.....*Chemistry*

Dissertation: Direct Hydrogenation of CO₂ to Methanol Over Solution Combustion Synthesised Supported Copper Catalysts.

Supervisors: Dr AS Mahomed and Professor HB Friedrich

Mvelase, Thembeke Ayanda.....*Ecological Sciences*

Dissertation: Interactive Effects of Fire History and Elevated Temperature on Aboveground Productivity in a High-altitude Mesic Grassland in South Africa

Supervisors: Dr MJ Tedder and Dr M Te Beest

Myeni, Ziningi Rosebud.....*Chemistry*

Dissertation: Synthesis and Application of Molecularly Imprinted Polymers for Removal of Triclosan in Wastewater.

Supervisors: Dr AS Mahomed and Dr OS Olatunji

Ncume, Mawande.....*Geology*

Dissertation: The Structural Evolution of the Bumbeni Complex and Bumbeni Ridge and its Relationship with Gondwana Break-Up: Insights from High Resolution Aeromagnetic Data and Field Mapping

Supervisor: Dr L Hoyer

Ndabandaba, Siphon Patrick.....*Biology*

Dissertation: Responses of *Phragmites australis* (cav.) Trin. ex Steudel to Oil Contamination

Supervisor: Dr AHH Macdonald

Ndabankulu, Khululwa Pheliwe.....*Botany*

Dissertation: Effects of Soil Acidity and Phosphorus Deficiency on Root Microbial Symbiosis and Nitrogen Nutrition of an Indigenous and Alien Invasive Legume in KwaZulu-Natal Grassland Ecosystem

Supervisors: Dr A Magadla and Dr Z Tsvuura

Ndamase, Liziwe.....*Chemistry*

Dissertation: New Pyrazolyl Functionalized N-heterocyclic Carbene Ligand Precursors and their Transition Metal Complexes for the Catalytic Oxidation of Paraffins.

Supervisors: Professor MD Bala and Professor BO Owaga

Ngerem, Emmanuel Chidi.....*Microbiology*

Dissertation: Optimization of Biomass Production and Lipid Formation from *Chlorococcum* sp. Cultivation on Dairy and Paper-Pulp Wastewater

Supervisors: Professor EB Gueguim Kana and Professor AO Olaniran

- Nosenga, Sive** *Chemistry*
 Dissertation: Synthesis, Characterization, and the Photocatalytic Behaviour of BiOI, Zinc Phthalocyanine and BiOI/ZnPc Composites.
 Supervisor: Dr PB Khoza
- Ogutu, Sarah Atieno**..... *Statistics*
 Dissertation: Concepts for the Construction of Confidence Intervals for Measuring Stability after Hallux Vulgus Surgery: Theoretical Development and Application
 Supervisors: Professor HG Mwambi and Professor A Ziegler
- Rajcomar, Shikar**..... *Computer Science*
 Dissertation: Ensemble Augmentation for Neural Network Models for Image Classification.
 Supervisors: Mr AW Pillay and Dr E Jembere
- Rakgoale, Perry Bafana**..... *Environmental Science*
 Dissertation: Identifying, Mapping and Analysing the Hot and Cold Spots of Burglaries: A GIS- based Case Study of the Greater Durban Area from 2015- 2017
 Supervisor: Dr NS Njoya
- * Rambaran, Neervana**..... *Biology*
 Dissertation: Phytochemical and Pharmacological Analyses of *Embelia ruminata* (E.Mey. ex A.DC.) Mez
 Supervisors: Professor Y Naidoo and Professor H Baijnath
- Rambaran, Vrishthi**..... *Biology*
 Dissertation: Microbial Community Study of Brine Evaporation Ponds: Identification and Analysis of the Total Organic Carbon Problem
 Supervisors: Dr A Nemukula, Dr PA Joslin and Professor Y Naidoo
- * Rughbeer, Yastil**..... *Computer Science*
 Dissertation: Improving the Performance of Pre-trained Information Retrieval Systems in Resource-Constrained Environments .
 Supervisors: Mr AW Pillay and Dr E Jembere
- Sewpersad, Tessnika**..... *Environmental Science*
 Dissertation: An Overview of the Soil Organic Matter Content Present within the Emakhosani Area, KwaZulu-Natal, South Africa using Remote Sensing Technologies
 Supervisor: Professor MT Gebreslasie

Shadamorgan, Vineshree *Biology*

Dissertation: Identification of *Macrourus* Species (Teleostei: Gadiformes) Found Near Prince Edward Islands in the Southern Ocean using Molecular and Morphological Analyses

Supervisor: Dr TP Miya

Sikakane, Berlinda Mandisa *Chemistry*

Dissertation: Synthesis, Structural and Photocatalytic Studies of ZnS and CuS Nanocrystals

Supervisor: Professor PA Ajibade

Sithole, Phumla Remember *Applied Mathematics*

Dissertation: On the Numerical Solution of the Lane-Emden, Bratu and Troesch Equations

Supervisors: Professor P Sibanda and Dr SP Goqo

Tenza, Petronella Nokukhanya *Genetics*

Dissertation: Diversity of *Eimeria tenella* Apical Membrane Antigen-1 from Chickens in Mpumalanga Province and its *In silico* Epitope Prediction as a Vaccine Candidate

Supervisors: Dr MA Adeleke and Dr A Fatoba

Voko, Mxolisi Peter *Botany*

Dissertation: Impacts of Climate Change on Cowpea (*Vigna unguiculata* L. Walp) Treated with Biostimulants

Supervisors: Professor J Van Staden and Professor JF Finnie

*** Zuma, Lindiwe Khumbuzile** *Biochemistry*

Dissertation: Production and Characterization of DNA Ligases Isolated from Kogelberg Biosphere Metagenomics Library

Supervisor: Dr OJ Poee

Master of Science in Agriculture

Dadabhay, Adeel *Plant Pathology*

Dissertation: Investigating the Effect and Efficiency of Steel Slag as a Source of Silicon for Plant Uptake

Supervisors: Professor MD Laing and Dr IH Basdeu

*** Hlongwana, Fortunate Yenziwe** *Animal Science*

Dissertation: Response in Nitrogen Balance, Fibre Digestibility and Physicochemical Characteristics of Digesta in Windsnyer Pigs fed on Incremental levels of Amarula Nut cake

Supervisor: Professor M Chimonyo

Makhaye, Gugulethu.....*Horticultural Science*

Dissertation: Physiological and Biochemical Effect of Biostimulants on *Abelmoschus Esculentus* (L.) and *Cleome Gynandra* (L.)

Supervisors: Professor SZ Tesfay and Dr AO Aremu and Mr SO Amoo

* **Mvelase**, Lungani Mzwandile.....*Agricultural Economics*

Dissertation: The Economic Impact of a Sugar-Sweetened Beverages Tax in South Africa

Supervisors: Dr SRD Ferrer and Mr MAG Darroch

Nkomo, Nqobile.....*Crop Science*

Dissertation: Assessing the Fertiliser Value of Co-composted Biochar Compost made from Black Soldier Fly Larvae Faecal Residue

Supervisor: Professor AO Odindo

* **Nzimande**, Thembelihle Nkosingiphile Millicent *Crop Science*

Dissertation: Application and Evaluation of Aquacrop, DSSAT and SIMPLE Model in Modelling Yield and Water Use of Selected Underutilised Cereal Crops

Supervisors: Professor T Mabhaudhi and Miss VGP Chimonyo

September, Nolwandle.....*Animal Science*

Dissertation: Perceptions of Consumers, Retailers and their Attitude towards Rabbit Meat in the KZN Province, South Africa

Supervisors: Dr ZT Rani and Professor RM Gous

Shelembe, Lindani Andile.....*Animal Science*

Dissertation: Herbs and Indigenous Knowledge used in Controlling Gastrointestinal Parasites Infestation in Sheep and Goats in KwaZulu-Natal, South Africa

Supervisor: Professor IV Nsahlai

Sokhela, Fortunate Sthabile.....*Crop Science*

Dissertation: Assessing the Potential Use of Struvite and Effluent from Decentralized Wastewater Treatment System (DEWATS) as Plant Nutrient Sources for Early Maize (*Zea mays*) Growth

Supervisors: Professor AO Odindo and Professor P Muchaonyerwa

Master of Science in Construction Management

Mathenjwa, Mcebo Mpucuko

Dissertation: Challenges Faced by Main-Contractors when Working with Inexperienced Sub-Contractors on Construction Projects in South Africa.

Supervisor: Professor N Harinarain

Zondo, Siyabonga Simon

Dissertation: Quality in South African Construction: A Construction Manager's Perspective

Supervisor: Professor N Harinarain

Master of Science in Engineering

* **Anganoo, Damian**..... *Civil Engineering*

Dissertation: Properties of "Green" Concrete Engineered from Industrial Waste Material: Paper Mill Boiler Ash & Waste Foundry Sand

Supervisors: Dr MW Kiliswa and Professor C Trois

* **Angula, Johannes Penda**..... *Mechanical Engineering*

Dissertation: CFD Modelling and Performance evaluation of a Forced Convection Mixed-mode Solar Grain Dryer with a Preheater

Supervisors: Professor FL Inambao and Mr E Zhandire

* **Arbee, Khadija Mohsin** *Civil Engineering*

Dissertation: Modelling the Effects of Soil Variability on Stability Analysis of Natural Slopes in Durban

Supervisors: Dr FI Aneke and Professor M Mostafa Hassan Mostafa

* **Botha, Ingrid Retha**..... *Mechatronics Engineering*

Dissertation: Integrated Low-Cost Reading Device Targeting the Accessibility to Quality Education for the Visually Impaired

Supervisors: Professor G Bright and Mr JET Collins

Buyeye, Zikhona..... *Agricultural Engineering*

Dissertation: Comparative Evaluation Of Small-Scale Vertical Hydroponic Structures Against Growing Plants In Soil with Respect to Growth Parameters and Resource use Efficiencies

Supervisors: Dr G Lagerwall and Dr A Senzanje

* **Chaitezvi, Lloyd** *Civil Engineering*

Dissertation: Sustainable Development: African City of the Future- Symbio Cities

Supervisors: Dr V Tramontin and Professor C Trois

Chatema, Tanaka Marcia..... *Chemical Engineering*

Dissertation: The Effect of Ageing on the Physicochemical Properties of Fresh Feaces

Supervisors: Professor CA Buckley and Dr J Pocock and Dr S Septien Stringel

- * **Chetty, Thavashni**..... *Chemical Engineering*
 Dissertation: Phase Equilibrium Studies and the Blending/Separation Potential of Alcohol, Ketone and Alkane Mixtures for Process Design Applications
 Supervisors: Dr K Moodley and Professor P Naidoo
- * **Harcus, Matt Brandon**..... *Mechatronics Engineering*
 Dissertation: Fused Deposition Modelling (FDM) to Fabricate a Transitional Vertical Take off and Landing (VTOL) Unmanned Aerial Vehicle (UAV) for Transportaion of Medical Supplies in Underdeveloped Areas
 Supervisor: Professor G Bright
- * **Hussain, Mishqah**..... *Chemical Engineering*
 Dissertation: Application of the Truncated Perturbed Chain-Polar Statistical Assosciaing Fluid Theory (tPC-PSAFT) to Alcoholo/Alkaline Mixtures at High Pressures
 Supervisor: Dr K Moodley
- Ismail, Amina** *Mechanical Engineering*
 Dissertation: Optimizing Energy Efficiency in State-Owned Commercial Buildings
 Supervisor: Professor FL Inambao
- Khashole, Motaoana Francis**..... *Chemical Engineering*
 Dissertation: Low Temperature Optimization of Copper Recovery from E-Waste
 Supervisors: Mr M G Ntunka and Dr SM Mkhize
- Khoosal, Shaheil**..... *Civil Engineering*
 Dissertation: The use of Local Information from Donor Catchments to Improve Selected Deterministicand Empirical Flood Estimation Methods Used in South Africa
 Supervisor: Professor JC Smithers
- Kisten, Rylene** *Chemical Engineering*
 Dissertation: Sustainable Plant-Derived Coagulating Agents in a Heterogeneous Platform for Front-end Water Purification
 Supervisor: Professor D Lokhat
- Loji, Kabulo** *Electrical Engineering*
 Dissertation: Voltage Control and Stability Analysis in a Mutli-Machine Power System with Increasing Penetration of Intermittent Renewable Energy Generation
 Supervisors: Dr R Tiako and Dr IE Davidson

- Mankge, Sello Leonard**..... *Electronic Engineering*
Dissertation: Power Allocation in a QoS-Aware Cellular-Based Vehicular Communication System
Supervisor: Dr F Ghayoor Najafabadi
- * **Matizakurima, Farai**..... *Chemical Engineering*
Dissertation: Separation of Noble Gas Mixtures of (Xe, Ar and Kr) using Gas Hydrate Technology
Supervisors: Professor D Ramjugernath and Mrs S Babaee and Professor P Naidoo
- * **Maivalal, Shivan**..... *Chemical Engineering*
Dissertation: Design and Optimization of a Separation Process for Butanediol Dehydration for Use as a Biofuel
Supervisor: Dr K Moodley
- Mkhize, Thabani Armstrong**..... *Civil Engineering*
Dissertation: "Standard Addition Chemical Analysis of Potentially Harmful Elements in Soil Samples from Mining Sites in Krugersdorp
Supervisor: Professor HB Friedrich
- α **Molefe, Mohale Emmanuel**..... *Computer Engineering*
Dissertation: Machine Learning Approach to Thermite Weld Defects Detection and Classification
Supervisor: Professor JR Tapamo
- * **Mupinga, Ratidzaishe Tracy**..... *Chemical Engineering*
Dissertation: Stickiness of Faecal Sludge for Drying Applications
Supervisors: Dr S Septien Stringel and Dr J Pocock
- Mushid, Cinyama**..... *Electrical Engineering*
Dissertation: Design of a Novel Axial-Fux Induction Machine for Traction Applications
Supervisor: Professor DG Dorrell
- * **Ncube, Randy**..... *Mechanical Engineering*
Dissertation: Design, Modelling and Optimization of a Seawater Reverse Osmosis Desalination Plant
Supervisor: Professor FL Inambao
- Ngubane, Nosipho Yolanda**..... *Chemical Engineering*
Dissertation: A Study of Swwt Sorghum as a Viable Biochemical and Bioenergy Crop in South Africa
Supervisors: Professor BB Sithole and Professor A Stark

- α Nowrouzi, Iman** *Chemical Engineering*
 Dissertation: An Insight into Enhanced Oil Recovery Process by Chemical Water Injection in Oil Reservoirs
 Supervisor: Professor AH Mohammadi
- Olawoye, Taiwo Oluwafemi** *Electronic Engineering*
 Dissertation: High Gain Wideband Microstrip Patch Antennas with Defected Ground Structure for Sub-6 GHZ 5G Communication
 Supervisor: Dr P Kumar
- Oso, Oluwabukunmi Williams** *Electronic Engineering*
 Dissertation: Index Modulation for Next Generation Radio Communications
 Supervisors: Dr N Pillay and Professor H Xu
- * Pillay, Deveshan Loganathan** *Civil Engineering*
 Dissertation: Alternattive Binder Materials for Rigid Pavements- An Investigation into the Structural and Sustainability Effects of Partial Cement Replacement with Pulp and Paper Mill Waste Ash in Concrete Pavements
 Supervisors: Professor M Mostafa Hassan Mostafa and Dr OB Olalusi
- Razavi, Seyedehsaleh** *Chemical Engineering*
 Dissertation: Thermo-Physical Properties Of Alkanolamine- Ethanol Hybrid Solutions: Experimental Measurements And Modeling
 Supervisor: Mr EM Obwaka
- Sibanda, Hudson** *Electrical Engineering*
 Dissertation: Optimal Sizing for a Grid-Connected Hybird Renewable Energy System
 Supervisors: Dr F Ghayoor Najafabadi and Dr AG Swanson
- Solwa, Shaheen** *Electronic Engineering*
 Dissertation: Artificial Intelligence Based Design Optimizations for Improving Diversity in Wireless Links
 Supervisors: Dr TA Quazi and Mr B Naidoo

Master of Science in Engineering in Waste and Resource Management

- * Pillay, Giselle Caitlin**
 Dissertation: Optimization of Waste Reduction in the Construction Sector: The Case Sstudy of the eThekwin Municipality in South Africa
 Supervisor: Professor C Trois

Master of Science in Land Surveying

Ntuli, Siphenini Simiso
Dissertation: Machine Learning, Classification of 3D UAV-SFM Poin Clouds in the University of KwaZulu-Natal (Howard College)
Supervisor: Mr AM Forbes

HONOURS DEGREES

Bachelor of Science Honours

Bangani , Sandisiwe.....	<i>Physics</i>
Bauchoo , Yastheer Hurriraj	<i>Physics</i>
Majozi , Siphesihle Bennedict.....	<i>Physics</i>
Mbingeleli , Aphiwe.....	<i>Crop And Horticultural Science</i>
Mthethwa , Noxolo.....	<i>Biological Sciences</i>
Mtshali , Nomathemba Treccy.....	<i>Geology</i>
Nene , Sinoxolo Moyomuhle	<i>Applied Mathematics</i>
Qhoboshiyane , Isibabale.....	<i>Physics</i>
Sanilall , Shannon Lee.....	<i>Biological Sciences</i>
Sibeko , Mengezi Cubic.....	<i>Physics</i>
Sikude , Queen.....	<i>Biochemistry</i>
Zuma , Nontethelelo Ntozonke	<i>Biological Sciences</i>
Zungu , Sakhile Marcus	<i>Physics</i>

Bachelor of Science Honours in Forensic Genetics

Dandala, Nolwazi

BACHELOR DEGREES

Bachelor of Science in Engineering (Agricultural Engineering)

Mayuze, Zanele
Ngubane, Sibusiso Lungisani
Thaba, Julias Phopimudanalo

Bachelor of Science in Engineering (Chemical Engineering)

Gwala, Thokozani Wiseman

Khoza, Sibonelo Zipho

Mkhize, Siyanda

Naidoo, Keanen Reece

Naiker, Yuvashen

Tenza, Mbuso Siphesihle

Bachelor of Science in Engineering (Civil Engineering)

Cele, Wandile

Ibrahim, Saghieda

Naidoo, Rylin Keane

Ntombela, Lwazi Knowledge

Sewnarain, Vimal

Bachelor of Science in Engineering (Computer Engineering)

Govender, Kalreen

Bachelor of Science in Engineering (Electrical Engineering)

Bele, Sichelokuhle Andreas

Bengu, Mfundo

Kheswa, Nkosinathi Wiseman

Ndamane, Ndumiso Perfect

Ntshale, Siphelele

Shozi, Thubelihle

Sibiya, Ayanda S'Phelele

Sikhosana, Sdumo Qiniso

Xulu, Thokozani

Zwane, Philasande Eric

Bachelor of Science in Engineering (Electronic Engineering)

Khumalo, Mfundo Lebo

Memela, Mhlengi Ntando

Bachelor of Science in Engineering (Mechanical Engineering)

Abdul Hai, Mahammad Saad
Bharoochi, Muhammad Husein
Bharoochi, Yusuf Husein
Bhola, Roneeth
Haffejee, Mikaaail
Macu, Sibonelosihle Mpatho Edward
Munisamy, Joshua Adrian
Mutambanengwe, Nigel Tatenda
Preston, Bevan Richard
Ramrathen, Revaan
Reddy, Thashia
Varga, Trent
Zubar Bobat, Mohammed Shahid

Bachelor of Science in Agriculture

Jobe, Qiniso Brilliant..... *Animal And Poultry Science*
Makhanya, Ndumiso *Plant Pathology*
Mngwengwe, Luleka *Plant Pathology*
Ngidi, Nelisiwe *Plant Breeding*
Shange, Sandile Welcome..... *Agricultural Economics*
Tshomela, Bongeka..... *Agricultural Economics*

Bachelor of Science in Land Surveying

Dlamini, Lungelo Brian
Hlabisa, Bandile Mfanafuthi
Mbotho, Nkanyiso
Mkhize, Nonjabulo
Valoyi, Ripfumelo

Bachelor of Science

Ahmed, Zahraa..... *Biochemistry, Genetics*
Anirudh, Krisha *Biochemistry, Microbiology*
Bhengu, Minenhle Good Sgrace *Environmental Science*
Bhikraj, Kiara *Biochemistry*, *Microbiology*

Bhimsan , Yuvir.....	<i>Computer Science</i>
Biyele , Mbali Nosipho.....	<i>Biological Sciences</i>
Blöse , Minenhle Nokukhanya.....	<i>Environmental Science</i>
Bongwe , Siphwe Ntombikayise.....	<i>Environmental Science</i>
Buthelezi , Kwanele.....	<i>Environmental Science</i>
Cele , Hesperus Kwenzokuhle.....	<i>Environmental Science</i>
Cele , Nonhlanhla.....	<i>Biological Sciences</i>
Chiliza , Nomvula Siphwe.....	<i>Marine Biology</i>
Chiliza , Siyabonga Johannes.....	<i>Mathematics, Physics</i>
Coetzee , Kuraisha.....	<i>Environmental Science</i>
Davidson , Hannah Osaruese.....	<i>Cell Biology, Genetics</i>
Diko , Sinalo Novevuya.....	<i>Chemistry And Chemical Technology</i>
Dlamini , Sithandile.....	<i>Environmental Science</i>
Dlamini , Thubelihle Noxolo.....	<i>Biochemistry, Microbiology</i>
Dube , Nothando Precious.....	<i>Biological Sciences</i>
Gangatha , Yamkela.....	<i>Computer Sc And Information Technology</i>
Gcabashe , Xoliswa.....	<i>Environmental Science</i>
Gumede , Njabulo.....	<i>Cell Biology</i>
Gumede , Samukelo.....	<i>Computer Sc And Information Technology</i>
Gumede , Zamanguni Owethu.....	<i>Biochemistry, Microbiology</i>
Gwala , Siphesihle Buhle.....	<i>Environmental Science</i>
Gwala , Thembela.....	<i>Environmental Science</i>
Harirajh , Nirvana.....	<i>Biochemistry, Microbiology</i>
Hirday , Sonalia.....	<i>Biochemistry, Genetics</i>
Hlabisa , Minenhle Nozibusiso.....	<i>Biochemistry, Microbiology</i>
Jayram , Kellysha.....	<i>Geography</i>
Jili , Azvedo Fernandes.....	<i>Environmental Science</i>
Kasarlall , Micaela Sinaed.....	<i>Genetics, Microbiology</i>
Khan , Muhammed Zidan.....	<i>Biochemistry, Microbiology</i>
Khumalo , Noxolo Cindy.....	<i>Cell Biology, Microbiology</i>
Khumalo , Nzuzo Ndabenhle.....	<i>Chemistry, Microbiology</i>
Kunene , Clifford Sithasiselo.....	<i>Biochemistry, Chemistry</i>
Mabena , Sifiso Zwelakhe Melusi.....	<i>Crop And Horticultural Science</i>
Mabika , S'Thandiwe.....	<i>Biological Sciences</i>
Madonda , Sboniso Simesihle.....	<i>Biochemistry, Genetics</i>
Mafambana , Nzuzo Cyril.....	<i>Genetics, Microbiology</i>
Maharaj , Arisha.....	<i>Genetics</i>
Majikija , Alizwa.....	<i>Environmental Science</i>
Makhura , Lerato.....	<i>Environmental Science</i>
Mankayi , Emihle.....	<i>Biochemistry, Microbiology</i>
Manqe , Siyanda Brian.....	<i>Geological Sciences</i>
Manzini , Kuhle.....	<i>Biological Sciences</i>

Mashele , Ntombifuthi	<i>Environmental Science</i>
Masimula , Nsindiso.....	<i>Biological Sciences</i>
Masuku , Sinabobonke Ntombiyenkosi	<i>Biochemistry, Chemistry</i>
Mathe , Londiwe.....	<i>Biochemistry, Microbiology</i>
Mazibuko , Ayanda Sindiswa	<i>Hydrology, Microbiology</i>
Mbanjwa , Zethembe Njabulo.....	<i>Biochemistry, Microbiology</i>
Mbatha , Phiwokuhle Nothando.....	<i>Chemistry And Chemical Technology</i>
Mbewana , Aviwe.....	<i>Biochemistry, Microbiology</i>
Mchunu , Nandi Ntobeko.....	<i>Environmental Science</i>
Mdletshe , Nontuthuko Nokwanda.....	<i>Plant Pathology</i>
Mdletshe , Nozipho Immaculate.....	<i>Cell Biology</i>
Mdletshe , Ntombifuthi Sphelele	<i>Geological Sciences</i>
Meganathan , Kaitlyn.....	<i>Biochemistry, Microbiology</i>
Mhlongo , Malibongwe Mpilehle.....	<i>Biochemistry, Microbiology</i>
Mhlophe , Sinegugu.....	<i>Biological Sciences</i>
Mjwara , Zekhethelo Pearl	<i>Biological Sciences</i>
Mkase , Ntiyiso Treasure.....	<i>Biochemistry, Microbiology</i>
Mkhize , Lindani Kusasalethu.....	<i>Plant Pathology</i>
Mkhize , Mxolisi Ingrid.....	<i>Biochemistry, Chemistry</i>
Mncwabe , Ntuthuko Prosperous.....	<i>Environmental Science</i>
Mncwabe , Zama Mxolisi	<i>Computer Sc And Information Technology</i>
Mngonyama , Esethu	<i>Environmental Science</i>
Mnqayi , Sibekezelo Sinethemba	<i>Biological Sciences</i>
Monelo , Esihle	<i>Biological Sciences</i>
Morrison , Lawrencecia Claudia Lecretia.....	<i>Biological Sciences</i>
Motala , Jameelah.....	<i>Environmental Science</i>
Mpisi , Ntandazo Samkelo.....	<i>Applied Mathematics, Mathematics</i>
Msimanga , Phumzile Lucia.....	<i>Marine Biology</i>
Msweli , Khayaletu Samukelo.....	<i>Genetics, Microbiology</i>
Mtakwende , Sandiswa Sandy Banele	<i>Biochemistry, Chemistry</i>
Mteshana , Eyami Londeka.....	<i>Biochemistry, Genetics</i>
Mthembu , Asanda	<i>Genetics</i>
Mthembu , Zamokuhle Walter Lancelot.....	<i>Biochemistry, Microbiology</i>
Mthethwa , Tshengisile.....	<i>Chemistry And Chemical Technology</i>
Mthimkhulu , Zamahlubi Awande.....	<i>Marine Biology</i>
Mthiyane , Sfundu.....	<i>Environmental Science</i>
Myeni , Nqobile Mellisa.....	<i>Environmental Science</i>
Myeza , Nomzamo Promise	<i>Biochemistry, Microbiology</i>
* Naicker , Hemeshree	<i>Biological Sciences</i>
Naicker , Sershni	<i>Genetics, Microbiology</i>
Naidoo , Devenita	<i>Biological Sciences</i>
Naidoo , Hayden Keaton	<i>Chemistry And Chemical Technology</i>

Naidoo, Kyle Luke	<i>Computer Sc And Information Technology</i>
Naidoo, Naomi	<i>Genetics, Microbiology</i>
Naidoo, Teniel Aiden	<i>Genetics</i>
Naidoo, Yovani	<i>Biological Sciences</i>
Ndima, Sbonelo	<i>Biochemistry, Genetics</i>
Ndlovu, Kwandokuhle Simphiwe	<i>Environmental Science</i>
Ndlovu, Sifiso Lindumusa	<i>Microbiology</i>
Ndlovu, Stefan Thobani	<i>Biochemistry, Chemistry</i>
Ndlovu, Thobeka Ziphelele	<i>Biochemistry, Microbiology</i>
Ndwandwe, Neliswa Ingrid	<i>Biochemistry, Microbiology</i>
Ngcobo, Sthembile Xolisile	<i>Environmental Science</i>
Ngema, Fezile Siphelele Pleasure	<i>Genetics</i>
Ngidi, Kwenzekile	<i>Biological Sciences</i>
Ngqulunga, Minenhle Qinisile	<i>Environmental Science</i>
Ngubo, Nkanyiso Ndumiso	<i>Environmental Science</i>
Ngwenya, Banzi	<i>Biochemistry, Microbiology</i>
Nkomo, Mkhanyisi Bridgeman	<i>Biochemistry, Microbiology</i>
Nkosi, Amanda Bathandwa	<i>Biochemistry, Microbiology</i>
Nkosi, Andiswa Sinenkosi	<i>Environmental Science</i>
Nogwanya, Siphamandla	<i>Biochemistry, Genetics</i>
Ntaka, Nomfundo Ayanda	<i>Environmental Science</i>
Ntombela, Zinhle Ignatia	<i>Applied Mathematics, Statistics</i>
Ntshangase, Mhlengi	<i>Biochemistry, Chemistry</i>
Ntuli, Sithembile Nompumelelo	<i>Environmental Science</i>
Nxele, Bongumusa Cecil	<i>Biochemistry, Chemistry</i>
Nxele, Zamaxasibe	<i>Biochemistry, Chemistry</i>
Nxumalo, Cebolenkosi Alex	<i>Applied Mathematics, Physics</i>
Nyoni, Emmanuel	<i>Biochemistry, Microbiology</i>
Nzama, Zilungele Zanolukhe Rejoyce	<i>Biochemistry, Chemistry</i>
Phakathi, Nosipho Noxolo	<i>Biochemistry, Microbiology</i>
Pillay, Claudelle Jasmine	<i>Biochemistry, Microbiology</i>
Pillay, Kamlin Kisten	<i>Computer Sc And Information Technology</i>
Pillay, Neeshlin	<i>Biological Sciences</i>
Pillay, Shannyn Jade	<i>Geography, Hydrology</i>
Powys, Chrysanda Tiara	<i>Microbiology</i>
Ramsamy, Evangeline Angel	<i>Applied Mathematics, Chemistry</i>
Rangata, Dolly Matlhone	<i>Plant Pathology</i>
Sefate, Lerato	<i>Chemistry And Chemical Technology</i>
Shabane, Nonjabulo Naomi	<i>Biochemistry, Genetics</i>
Shangase, Menzi Emmanuel	<i>Biochemistry, Microbiology</i>
Sheganlall, Harshil Neeran	<i>Computer Sc And Information Technology</i>
Shezi, Nokubongwa	<i>Marine Biology</i>

Sibiya, Nkanyiso	<i>Environmental Science</i>
Sikhakhane, Bhekumusa	<i>Biological Sciences</i>
Silabela, Sanele	<i>Biochemistry, Microbiology</i>
Sithole, Bongimpilo	<i>Genetics, Microbiology</i>
Sithole, Sandiso Ziphokuhle	<i>Biochemistry, Chemistry</i>
Soni, Fezeka Emerald	<i>Chemistry And Chemical Technology</i>
Steele, Andrew Dion	<i>Environmental Science</i>
Tsofela, Nanini Delicious	<i>Biochemistry, Microbiology</i>
Tyani, Monalisa	<i>Microbiology</i>
Vundla, Nokuzola Augustine Nicoline	<i>Biological Sciences</i>
Xaba, Phethele	<i>Environmental Science</i>
Xaba, Sphesihle Talente	<i>Environmental Science</i>
Ximba, Lwazi Mhlengi Thokozani	<i>Applied Chemistry</i>
Xulu, Avela Siphesihle	<i>Environmental Science</i>
Zondi, Mlungisi	<i>Crop And Horticultural Science</i>
Zondo, Lungani Clinton	<i>Crop And Horticultural Science</i>
Zulu, Thabani Fortune	<i>Genetics, Microbiology</i>
Zungu, Sinethemba Sibahle	<i>Microbiology</i>

POSTGRADUATE DIPLOMAS

Postgraduate Diploma in Dietetics

Deonarain, Riyanka Roshan

Gordon, Schalk Willem Wentzel

The Graduation Ceremony

The graduation ceremony has a long history and is steeped in tradition. It dates back to the establishment of the first universities in Europe in the 12th century.

The Chancellor

“Chancellor” is an office that goes back to Roman times: the original chancellor or **cancellarius** (as the office was known), regulated access to the Roman Tribune. In medieval times, the office became associated with the heads of writing departments of the early kings. Because so few people were literate, a chancellor was necessarily learned. This is why the heads and spokespersons of the early universities were also accorded this title. More recently the office has become largely symbolic and the executive head of a university is its vice-chancellor. One of the Chancellor’s primary roles is to confer degrees at the graduation ceremonies.

Dr RJ Khoza is the fourth Chancellor of the University of KwaZulu-Natal.

The Mace



The University of KwaZulu-Natal Mace was designed and executed by local sculptor Mr Zamokakhwe Gumede and is carved from an indigenous wood, Drakensberg bottlebrush (**umBande**), gathered from the artist’s home near Bergville.

The head of the Mace is made up of three opened book-like forms, suggestive of scholarship but also of the massive landscape forms of our province, onto each of which is placed a ruler, a pen and a pencil. These refer respectively to the scientific and computational, the text-based and the creative sides to the University’s work. Below this are an encircling set of heads, representing the diverse university community. The whole is surmounted by an alighting secretary bird (iNtungunono), an elegant and active bird found throughout the province and equally at home on land or in the air. At the foot of the Mace is a hoof-like shape, giving a sense of contact with the soil of Africa.

The carrying of the mace in the procession symbolises the university’s status as a degree awarding institution.

Academic Dress

The wearing of gowns by judges, ministers, teachers and scholars is an ancient and significant custom. By wearing a gown when receiving their degrees and diplomas, the graduating student participates in this long tradition and joins hands with students past and present.

The hood conveys the most amount of information with the addition of braid or coloured linings differentiating the different qualifications. The colour of the band or hood lining represents the College, each of which has its own colour.

Convocation

The Convocation of the University of KwaZulu-Natal is the statutory body consisting of all alumni and the academic staff (current and retired) of the University. On graduation, graduates and diplomates automatically become members of Convocation which is the largest stakeholder body with over 140 000 members. Convocation provides a link with graduates, past and present, and through this structure graduates have the opportunity to play a continuing role in the affairs of the University.

After being capped by the Chancellor, each graduate moves across the stage and hands the hood to the Robing officer who represents the Convocation of the University. The Robing officer places the hood upon the graduate's shoulders and, in so doing, symbolises acceptance into the Convocation of UKZN.



The University Logo

The original University Logo was officially launched on 27 February 2004 and it is a powerful visual symbol through which the University projects an image of excellence. In addition, it emphasises the University's standing and integrity within the province of KwaZulu-Natal and within the academic and business communities, at home and abroad. Above all, it provides an identity around which internal stakeholders – staff and students – unite.

The African shield symbolises the protection of our most valuable assets, namely, education, culture and, by extension, African scholarship. The globe with multi-coloured rays epitomises a rising sun, a new beginning and acts as a symbol of enlightenment.

Further, the globe represents the University as a global player, producing world-class graduates, while the multi-coloured rays embody diversity – race, culture, language – as well as social values. The book/wave/wings, which underscore the visual, represent the foundation of knowledge, the spirit of the eastern seaboard, and soaring to new heights.

the University logo represents a University that is rooted in and responsive to Africa's unique qualities, challenges, diversities and strengths, while, at the same time, nurturing and protecting African Scholarship.

On 3 June 2010 the current logo, with the isiZulu translation was approved.

UKZN Graduation Anthem: IHELE

(written and composed by
Phelelani Mnomiya)

Obani labo?
Baphi?
Ngibona beza beyikazela
Bathwel' ongiyane
Bavela kuphi na?
Obani labo?
Ongqondongqondo,
oSibakhulu
Yibo Laba
Yini na leyo
Ihele, ihele lezingwazi
zakithi
Udwendwe lwezingqwele
zakithi
Nant' ihele
loNgqondongqondo
Nant' ihele loSibakhulu
Udwendwe lwezingqwele
zakithi
Dedani bangene; kodwa
nathi siyeza
Dedani badlule; nathi
siyalandela
Sithi: halala, halala
Halala maqhawe esizwe
sethu
Unwel' olude, inkonzo enhle
Sithi: halala!

GAUDEAMUS IGITUR

Gaudeamus igitur, juvenes
dum sumus;
Gaudeamus igitur, juvenes
dum sumus;
Post jucundam juventutem,
post molestam senectutem,
Nos habebit humus, nos
habebit humus.
Ubi sunt qui ante nos in
mundo fuere?
Ubi sunt qui ante nos in
mundo fuere?
Vadite ad superos, transite
ad inferos,
Ubi jam fuere, ubi jam fuere.
Vita nostra brevis est, brevi
finietur;
Vita nostra brevis est, brevi
finietur;
Venit mors velociter, rapit
nos atrociter,
Nemini parcetur, nemini
parcetur.
Vivat Academia, vivat
Professores,
Vivat Academia, vivat
Professores,
Vivat membrum quodlibet,
vivat membra quaelibet,
Semper sint in flore, semper
sint in flore.

NATIONAL ANTHEM

Nkosi sikelel' iAfrika
Maluphakanyisw' uphondo
lwayo
Yizwa imithandazo yethu
Nkosi sikelela
Thina lusapholwayo.
Morena boloka
Setjhaba saheso
Ofedise dintwa
lematshwenyeho.
O se boloke, O se boloke
Setjhaba saheso
Setjhaba sa, South Afrika,
South Afrika.
Uit die blou van onse hemel
Uit die diepte van ons see
Oor ons ewige gebergtes
Waar die kranse antwoord
gee
Sounds the call to come
together
And united we shall stand
Let us live and strive for
freedom
In South Africa our land.



UNIVERSITY OF
KWAZULU-NATAL TM
—
INYUVESI
YAKWAZULU-NATALI