

## 1.0 Current Research Interests

- Laser based additive Manufacturing,
- LEAN manufacturing
- Product design,
- Sheet metal work.

## 2.0 Qualifications

2.1 PhD Industrial and Manufacturing Engineering (BIUST, Botswana) 2016-2021

**Research Topic:** Experimental and Numerical Investigation of Laser Cladding Remanufacturing Coatings for Wear and/or High Temperature Oxidation Resistance Application

2.2 MEng in Manufacturing Engineering & Operations Management (NUST, ZW) 2006-2008

2.3 BEng. (Hons) Industrial & Manufacturing Engineering (NUST, ZW) 1999-2004

2.4 PGDHE- Postgraduate Diploma in Higher Education (NUST, ZW) 2014-2015

## 3.0 Publications

### 3.1 Scientific Journals (Refereed)

1. **Nyadongo, S. T.**, Olakanmi, E. O., & Pityana, S. L. (2022). Analysis of dry sliding wear performance of triballoy T-800/Tungsten carbide coating deposited via laser cladding assisted with preheating. *Journal of Materials Engineering and Performance*, 1-15.
2. **Nyadongo, S. T.**, Olakanmi, E. O., & Pityana, S. L. (2021). Experimental and numerical analyses of geometrical and microstructural features of Triballoy T-800 composite coating deposited via laser cladding-assisted with pre-heat (LCAP) process. *Journal of Manufacturing Processes*, 69, 84-111.
3. **Nyadongo, S. T.**, Pityana, S. L., & Olakanmi, E. O. (2021). Isothermal Oxidation Performance of Laser Cladding Assisted with Preheat (LCAP) Triballoy T-800 Composite Coatings Deposited on EN8. *Coatings*, 11(7), 843.
4. Olakanmi, E. O., Malikongwa K., **Nyadongo S. T.**, Shaik Hoosain S. & Pityana S. L. (2020) Consolidation mechanism, microstructural evolution and corrosion resistance of Inconel 625 coatings, *Surface Engineering*, DOI: 10.1080/02670844.2020.1783746
5. Olakanmi E. O., **Nyadongo S. T.**, Malikongwa K., Lawal S. A., Botes A., Pityana S. L. (2018). Multi-variable optimisation of the quality characteristics of fiber-laser cladded Inconel-625 composite coatings. *Surface & Coatings Technology* 357 pg 289–303
6. Gwangwava N., **Nyadongo S. T.**, Mathe C. Mpofu K. (2013). Modular clusterization product design support system. *International Journal of Advances in Computer Science and Technology (IJACST)*, Vol. 2, No. 11, Pages 8-18
7. Meda, L. N., Nyadongo, S. T., & Dukuswa, I. (2023, June). Optimization of baking parameters in producing bread through development of a generic control system. In *AIP Conference Proceedings* (Vol. 2581, No. 1). AIP Publishing.

### 3.2 Conferences (refereed)

1. Nduna N., **Nyadongo S. T.**, Munyau M. (2021). Reliability Centred Maintenance of Refuse Trucks for Maintenance and Cost Optimization. A Case Study of X Town Council. 3rd International Conference on Engineering Facilities, Maintenance & Management Technologies (**EFM2T'21**), BIUST, Palapye – Botswana (Online), 28-29 Oct 2021
2. Meda N. L., **Nyadongo S. T.**, Dukuswa I. (2021). Optimization of Baking Parameters in Producing Bread through Development of a Generic Control System 3rd International Conference on Engineering Facilities, Maintenance & Management Technologies (**EFM2T'21**), BIUST, Palapye – Botswana (Online), 28-29 Oct 2021
3. Gwebu A, Nyanga L., Nyadongo S.T., Van der Merwe A.F., Mhlanga S (2014), Effect Of Mould Temperature On The Filling Behavior Of Molten Resin In Plastic Injection Moulding Of High Density Polyethylene (HDPE), SAIIE26 Proceedings, 14th – 16th of July 2014, Magaliesburg, South Africa © 2014 SAIIE, pp 1167-1 – 1167-12

### 4.0 Key Positions held

- 4.1 Expert – Member of Writing Team Preparation of an APET Experts' Report on 3-D PRINTING Technology for AUDA - NEPAD July 2022 - Date
- 4.2 Senior Lecturer (Dept. of Industrial and Manufacturing Engineering) June 2022 - Date
- 4.3 Lecturer (Dept of Industrial and Manufacturing Engineering) Oct 2015 – May 2022
- 4.4 Part time Lecturer (Dept of Industrial and Manufacturing Engineering) April 2012 - Sept 2015
- 4.5 Chief Technician (Dept of Industrial and Manufacturing Engineering) April 2012 - Sept 2015
- 4.6 Section Mechanical Engineer - Traction (National Railways of Zimbabwe) Jan 2007 – June 2008
- 4.7 Section Mechanical Engineer - Rolling Stock (National Railways of Zimbabwe) Sept 2006 – Dec 2006
- 4.8 Trainee Engineer (National Railways of Zimbabwe) June 2005 – Aug 2006
- 4.9 Engineering Trainee (Lancashire Steel (Pvt.) Ltd.), Sept 2002 - June 2003

### 5.0 Industrial Experience in Detail

#### i. Senior Lecturer (June 2022 – Date)

**National University of Science and Technology** (Department of Industrial and Manufacturing Engineering)

#### Main Responsibilities

- Contributing to the research profile of the Department and personal research programme in line with the Department's research priorities.
- Teaching at undergraduate and postgraduate level in areas allocated by the Head of Department and reviewed from time to time by the Head of Department.
- Curriculum development.
- Engagement in subject professional and pedagogy research as required to support teaching activities. Program coordination in the department

- Carrying out research and produce publications, or other research outputs.
- Engaging with the broader scholarly and professional communities.
- Supervision of undergraduate, taught graduate (Masters).
- Contributing to the development, planning and implementation of a high quality curriculum.
- Development of learning materials, preparing schemes of work and maintaining records to monitor student progress, achievement and attendance.
- Participating in departmental and faculty seminars aimed at sharing research outcomes and building interdisciplinary collaboration within and outside the department.
- Participating in the development, administration and marking of exams and other assessments.
- Providing Class tutorship care and support to students.
- Entering student assignment and examination marks on Navision
- Industrial Training & Attachment coordination for the department - being a link between industry and the students.

## **ii. Lecturer (October 2015 – May 2022)**

**National University of Science and Technology** (Department of Industrial and Manufacturing Engineering)

### **Main Responsibilities**

- Teaching at undergraduate level in areas allocated by the Head of Department and reviewed from time to time by the Head of Department.
- Curriculum development.
- Carrying out research and produce publications, or other research outputs.
- Engaging with the broader scholarly and professional communities.
- Supervision of undergraduate, taught graduate (Masters).
- Contributing to the development, planning and implementation of a high quality curriculum.
- Development of learning materials, preparing schemes of work and maintaining records to monitor student progress, achievement and attendance.
- Participating in departmental and faculty seminars aimed at sharing research outcomes and building interdisciplinary collaboration within and outside the department.
- Participating in the development, administration and marking of exams and other assessments.
- Providing Class tutorship care and support to students.
- Entering student assignment and examination marks on Navision
- Industrial Training & Attachment coordination for the department - being a link between industry and the students.

### **iii. Chief Technician (April 2012 – Sept 2015)**

**National University of Science and Technology** (Department of Industrial and Manufacturing Engineering)

#### **Main Responsibilities**

- Project management for the departmental laboratory equipment acquisition project.
- Lecturing of students in: Concurrent Engineering, Industrial Design, Manufacturing Engineering Design and Manufacturing Technology.
- Quality control, enforces safety regulations, and perform other related task pertaining to the proper functioning of the laboratory.
- Responsible for establishing the Departmental technical vision and leading all aspects of technology development in line with university vision.
- Leading the strategy for technology platforms, partnerships and external relationships.
- Provide technical advice to the department.
- Communication and coordinate meetings with external customers in the acquisition of laboratory equipment and consumables.
- Preparation of reports budgets and relevant memorandums in line with the department.
- Recommend and execution of training programs for the staff and students.

### **(iii) Section Mechanical Engineer (Traction) (January 2007 – June 2008)**

**National Railways of Zimbabwe**

#### **Main Responsibilities**

- Managing cost centre financial performance and taking corrective action where necessary.
- Processing work orders and controlling spares inventory by authorising purchase requisitions.
- Forecasting maintenance spares/materials requirements based on anticipated demand.
- Process Improvement of maintenance processes and systems.
- Preparing work schedules by interrelating demand with capacity.
- Preparation of annual budgets.
- Provision of technical advice, supervision of subordinate senior foremen and foremen on both mechanical and electrical aspects for Diesel-Electrical locomotives, plant and machinery.
- Administration and management of the maintenance depot.
- Ensuring optimal utility of locomotives by means of quality assurance in the repairs and planned maintenance activities of locomotives.
- Involved in maintenance of Safety, Health and Environmental organizational objectives at the depot.
- Analysis of locomotive failure reports for trends, investigation of possible causes and recommendation of suitable solutions.
- Ensuring that all plant and equipment are adequately serviced for safe operating environment.
- Processing administrative and personnel matters relating to locomotive maintenance.

### **(iv) Section Mechanical Engineer (Rolling Stock) (Sept 2006 – Dec 2006)**

**National Railways of Zimbabwe**

#### **Main Responsibilities**

- Project management of the National Railways of Zimbabwe Coach Refurbishment Exercise.
- Project management of the National Railways of Zimbabwe Steam Locomotives Retubing Exercise.

- Compilation of monthly performance analysis report to the Area Engineer on wagon, coaches and steam locomotives.
- Implement Quality Assurance processes in the repairs and planned maintenance on wagons, coaches and steam locomotives.
- Maintenance of safety, health and safety objectives for the organization within the maintenance depot.
- Provision of professional advice, supervision of subordinates on mechanical aspects involving coaches and wagons.
- Responsible for inter-border exchange of wagons and coaches at the Zimbabwe/Zambia border interface.

**(iv) Trainee Mechanical Engineer (June 2005 – August 2006)**

**National Railways of Zimbabwe**

**Main Responsibilities**

- Involved in Locomotive engine build up.
- Analysis of traction motor failures and recommending suitable corrective action.
- Repair and servicing of motors and compressors.
- Initialization into wagon and coach maintenance.
- Understanding project requirements and completing all duties assigned by the Supervisor.
- Shadowing senior staff members and assisting wherever possible.
- Process improvement suggestions where appropriate.
- Conducting research and development.
- Participating in meetings and attending workshops and other training initiatives in the various sections.
- Analyzing data and writing reports according to specifications.

**(v) Engineering Trainee, September 2002 to June 2003**

**Lancashire Steel (Pvt.) Ltd. Kwekwe (Industrial Training Attachment)**

**Main Responsibilities**

- Forecasting the production material requirements.
- Create production plans and schedules for the Rod mill and Wire mill.
- Conducting Process Improvement projects.
- Maintaining Mechanical and electrical planned maintenance procedures.
- Issuing production orders to cater for sales orders.
- Preparing production budgets.
- Involved in Quality Assurance in whole production system.
- Undergo basic machine shop practice.

## 6.0 Courses Taught at Undergraduate level

Year	Course Code	Course Title
2023	PPC702S	Process Planning & Cost Estimation
2023	ETM810S	Engineering & Technology Management
2022-Date	EIE 1107	Human Factors Engineering
2020-Date	TIE 5216	Advanced Manufacturing Technology (AMT)
2020-Date	TIE 5103	Manufacturing Processes
2012 – 2017	TIE 1105	Introduction to Industrial Engineering
2018	INME 411	Supply Chain Management
2014	TIE 3220	Manufacturing Engineering Design
2016	PTE 2189	Manufacturing Systems and Processes
2017- Date	TIE 3119	Concurrent Engineering I
2012-2020	TIE 3219	Concurrent Engineering II
2014-2019	TIE 1104	Ergonomics & Industrial Safety I
2014-2019	TIE 1204	Ergonomics & Industrial Safety I
2014 – 2016	TTE 3119	Industrial Design
2015	TIE 3213	Wood Manufacturing Processes (part-time)
2014-2016	TBE 1246	Manufacturing Technology (part-time)

## 7.0 Courses Taught at Postgraduate level

Year	Course Code	Course Title
2023	TIE 6220	Automation & Robotics
2020-Date	TIE 6122	Manufacturing Technology
2021-Date	TIE 6124	Concurrent Engineering

## 8.0 Students' Supervision

8.1 POSTGRADUATE: 20

8.2 Final Year Projects that were supervised UNDERGRADUATE: 55

## 9.0 Membership of Learned and Professional Societies

Zimbabwe Institution of Engineers	Member	2014-date
2. Zimbabwe Institution of Engineers	Representative of Women in Engineering (WIE) Branch, Bulawayo Chapter	2014-2016
3. Zimbabwe Institute of Engineers	Bulawayo Chapter Committee Member	2014-2016
4. Zimbabwe Institute of Engineers	Publication Committee Member	2014-2016
5. Engineering Council of Zimbabwe	Member	2014-date

## 10.0 Membership of Committees at Faculty Level

1. Member – Faculty board of examiners (2021- Date)

## 11.0 Departmental Positions

1. Industrial Training Attachment (ITA) (2021 - Date)

- |  |               |
|--|---------------|
| 2. Member of Departmental board of examiners | (2012 - Date) |
| 3. Class Tutor Part I                        | (2013-2016)   |

## 12.0 Community Held Positions

1. PSMAS Autoclave Ventilator Design	Member	2021-date
2. Green Gables High School	Board Member	2018-date
3. Eagles Wings Albinism Care & Support	Board Member	2019-date
4. Eagles Wings Albinism Care & Support	Chairperson	2020-date

## 13.0 University Outreach

Was in the team involved in:

- Setting up of the Engineers Without Borders (EWB) Zimbabwe (2021)
- Voluntary mentoring, coaching of girls in school, community.

## 17.0 List of Professional Referees

1. Dr. Lameck Mugwagwa (Chairman)

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Department of Industrial and Manufacturing Engineering  
P. O. Box 939, Ascot  
Bulawayo, Zimbabwe  
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2. Dr Busiso Mthunzi (Dean)

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P. O. Box 939, Ascot  
Bulawayo, Zimbabwe  
Tel: 263-292-2282842 Cell +263 716 583 271  
Email: busiso.mtunzi@nust.ac.zw

3. Eng. T. R. Chikowore

Turnall Holding Limited,  
Steel Works Rd W,  
Bulawayo, Zimbabwe  
Tel: 263-292-2282842 Cell +263 777 023 095  
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4. Eng. S. Mhlanga (Senior Lecturer)

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