

DR. MUGUTHU JOSEPH NJUGUNA

CURRICULUM VITAE

1.1 Personal Profile

1.1.1 Personal Details

Name: DR. JOSEPH NJUGUNA MUGUTHU
Department: ENERGY, GAS AND PETROLEUM
Designation: LECTURER
Area of Specialization:

Manufacturing and Automation
Modeling and Simulation
Energy Modeling
Process Optimization

Research Interests:

Renewable energy Technology
Energy Modeling
Energy Processes Optimization

Google Scholar: Dr. Joseph N. Muguthu
ORCID ID: 0000-0001-5681-3113

1.1.2 Academic & Professional Qualifications

1.1.2.1 PhD

2010-2013: PhD. in Mechanical Manufacture and Automation, Harbin Institute of Technology, Harbin, China, July 2013

1.1.2.2 Masters

2003-2007: Master of Philosophy in Technology Education (Mechanical Technology), Moi University, Kenya

1.1.2.3 Undergraduate

1992-1996: Bachelor of Education (Technology Education), Second Class Honors Upper Division, Moi University, Kenya

1.1.2.4 High School

1987 – 1990: KSCE, Nyandarua High School

1.1.2.5 Primary School

1978-1986: KCPE, Uhuru Primary School

1.1.3 Employment History

- 1.1.3.1 July 2023 to Date:** Lecturer, Energy, Gas and Petroleum Department Kenyatta University
- 1.1.3.2 June 2015 to July 2023:** Lecturer, Energy Technology Department, Kenyatta University
- 1 Feb 2014. - June 2015:** Lecturer, Mechanical Engineering Department, Kenyatta University
- 1.1.3.4 Jan. 2005 – Feb. 2014:** Assistant Lecturer Mechanical Engineering Department, Teachers Service Commission, Thika Technical Training Institute
- 1.1.3.5 Jan. 1999 – Aug. 2003:** Mathematics, Physics and Computer Studies Teacher, Hekima Girls High School
- 1.1.3.6 Sep 1996 – Dec 1998:** Assistant Lecturer, Mechanical Engineering Department Mombasa Polytechnic (Current Technical University of Mombasa)

1.1.4 Achievements

1.2 Publications

1.2.1 Referred Journals

- 1.2.1.1 V. Wambui, F. Njoka, **J. Muguthu**, P. Ndwali., “Scenario analysis of electricity pathways in Kenya using Low Emissions Analysis Platform and the Next Energy Modeling system for optimization: Renewable and Sustainable Energy Reviews, 168, Oct 2022
- 1.2.1.2 M. Makenzi, **J. Muguthu**, E. Murimi., Novel design and sizing approach for optimal installation of solar water pumping setups”. Journal of Applied Solar Energy 57, 5, 391-402. DOI: 10.3103/S0003701X21050091., 2021
- 1.2.1.3 M. Makenzi, **J. Muguthu**, E. Murimi., “Maximization of site-specific solar photovoltaic energy generation through tilt angle and sun-hours optimization”. Journal of Renewable Energy, 2020, 1-11, DOI: 10.1155/2020/8893891, 2020

- 1.2.1.4 E.Y. Kombe, **J. Muguthu**, “Wind Energy Potential Assessment of Great Cumbrae Island Using Weibull Distribution Function”, Journal of Energy Research and Reviews, 1-8, DOI: 10.9734/JENRR/2019/v2i229734., 2019
- 1.2.1.5 E. Y. Kombe, **J. Muguthu**, “Geothermal Energy Development in East Africa: Barriers and Strategies”, Journal of Energy Research and Reviews 2 (1), 1-6, DOI: 10.9734/JENRR/2019/v2i129722, 2018
- 1.2.1.6 J. C. Ngugi, P. Muchiri, **J. Muguthu**, C. Nkundineza. “Quality Failure Analysis and Quality Improvement Methods in Small and Medium Manufacturing Companies (A Case Study of Shamco Industries Limited)”. International Journal of Scientific & Technology Research Volume 7, Issue 4, ISSN 2277-8616, Apr 2018,
- 1.2.1.7 B. Osodo, D. Nyaanga, J. Kiplagat, **J. Muguthu**, “Optimum Air Velocity, Air Temperature and Maize Layer Thickness for Highest Moisture Removal Rate and Drying Efficiency in a Forced Convection Grain Dryer”, American Journal of Food Science and Technology, DOI:10.12691/ajfst-6-6-6, 2018, Vol. 6, No. 6, 263-273
- 1.2.1.8 J.M. Wathigo, J.N. Keraita, J.B. Byiringiro, **J. N. Muguthu**, “Investigation on Optimal Cutting Parameters in Turning AISI 8660 Steel Using Silicon (SiC) Whisker Reinforced Ceramic Tool”, IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE), 2017
- 1.2.1.9 B. Osodo, D. Nyaanga, **J. N. Muguthu**, “Selection and Verification of a Drying Model for Maize (*Zea mays* L.) in Forced Convection Solar Grain Dryer”, American Journal of Food Science and Technology 5 (No. 3), 93-100, DOI: 10.12691/ajfst-5-3-4, 2017
- 1.2.1.10 **J. N. Muguthu**, and Gao Dong “Profile Fractal Dimension and Dimensional Accuracy Analysis in Machining MMCs”, Journal of Materials Manufacturing Processes, Volume 28, Issue 10, pages 1102-1109, 2013, DOI: 10.1080/10426914.2013.823501
- 1.2.1.11 **J. N. Muguthu**, Gao Dong and Zhaopeng Hao “Tool Wear, Surface Integrity and Dimensional Accuracy in Turning Al2124SiCp (45%wt) Metal Matrix Composite using cBN and PCD Tools”, Research Journal of Applied Sciences, Engineering

and Technology, 6 (22):4138-4144, 2013ISSN: 2040-7459; e-ISSN: 2040-7467.

- 1.2.1.12 **J. N. Muguthu** and Gao Dong. “Profile Fractal Characterization and Tool Wear in Turning Al2124SiCp (45%wt) MMC using cBN and PCD Tools”. Journal: Research Journal of Applied Sciences, Engineering and Technology (Revised paper accepted for publication on 8th May 2013).
- 1.2.1.13 **Muguthu J. N.**, Gao Dong and Ikua B. W. “Optimization of Parameters Influencing Machinability of Al2124SiCp (45%wt) MMC”. Journal: Journal of Composite Materials (DOI: 10.1177/0021998313516141 2013)
- 1.2.1.14 **Muguthu J. N.** and Gao Dong “Experimental Study on Performance of coated cBN, uncoated cBN and PCD tools in Turning Al 2124 SiC (45%wt) PMMC”, Journal: Key Engineering Materials Vol. 567 (2013) pp 27-31 doi: 10.4028/www.scientific.net/KEM.567.27
- 1.2.1.15 Gao Dong; Hao Zhaopeng; Han Rongdi; Chang Yanli; **J. N. Muguthu**. “Study of cutting deformation in machining nickel-based alloy Inconel 718”, International Journal of Machine Tools and Manufacture, Volume 51, Issue 6, June 2011, Pages 520–527.
- 1.2.2 University Level Scholarly Books
- 1.2.3 Patented Invention or Innovations
- 1.2.4 Tertiary Level Scholarly Books
- 1.2.5 Book Chapters
- 1.2.6 Refereed Learning Modules
- 1.2.7 Reviewed Conference Papers
- 1.2.7.1 **J. N. Muguthu**, N. Langat., “Financing Sustainable Energy Projects in Agriculture”,
1st Pan-African Society of Agricultural Engineers Conference., Mayfair Hotel,
Nairobi (March 2018)
- 1.2.7.2 Booker O., D. Nyaanga, J. Kiplagat, **J. N. Muguthu.**, “Optimisation of an
Experimental Forced Convection Grain Dryer Using Taguchi Approach”, 1st Pan-
African Society of Agricultural Engineers Conference., Mayfair Hotel, Nairobi
(March 2018)
- 1.2.7.3 **J. N. Muguthu**, D Gao., Tool Wear, Wear Mechanism and Dimensional Accuracy
in Machining Al2124SiCp MMC using CBN and PCD Tools, Proceedings of

Sustainable Research and Innovation Conference, 345-349, 2015

- 1.2.7.4 **Muguthu, J. N.** and Ikua, B. W., “Roadmap to Industrialization- Preparedness of Human Resource in Metal Manufacturing Industries in Kenya”, Scientific and Industrialization Conference, JKUAT, (Dec. 2007).
- 1.2.7.5 **Muguthu J. N.**, Kitainge M K. and Siomwene. “Just In Time Technology: What Are The Issues Related To Institutional Management?”, Kenya Association of Educational Administration & Management (KAEAM) 1st Conference 2007 Duration: 9-11 April 2007, Eldoret, Kenya.
- 1.2.7.6 **Muguthu J. N.** Dimo H. A., Okemwa P. Kitainge M. K. and Nganga S. I. “Just-In-Time Manufacturing Techniques” Position of Metal Manufacturing Industries in Kenya”. Jomo Kenyatta University of Agriculture and Technology Scientific, Technological and Industrialization Conference 26th and 27th Oct 2006
- 1.2.7.7 Kitainge M. K. and Nganga S. I. **Muguthu J. N.** and “Equitable Participation in Automotive Program Design: The Two Opposed Cases”2006 Jomo Kenyatta University of Agriculture and Technology Scientific, Technological and Industrialization Conference. 26th and 27th Oct 2006
- 1.2.7.8 **Muguthu J. N.**, Dimo H. A. and Okemwa P. “Limitations to Just-In-Time Implementation in Kenyan Manufacturing Industries” Jomo Kenyatta University of Agriculture and Technology Scientific, Technological and Industrialization Conference. 27th and 28th Oct 2005

1.2.8 Secondary School Level Textbooks

1.2.9 Short Communication in Journals

1.2.10 Consultancy and Project Reports

1.2.11 Non - Reviewed Conference Papers

1.2.12 Refereed Exhibitions and Performances

1.2.13 Other Publications

1.2.14 Editorship of a Book or Conference Proceedings

1.2.15 Scholarly Presentations at Conferences/Workshops/Seminars

1.2.16 Book Review Published in Refereed Journals

1.3 QUALITY TEACHING, LEARNING AND MENTORSHIP

1.3.1 Student Evaluations

1.3.1.1 ECU 401 2020/2021 First Semester: Score 96.09%

1.3.1.2 SET 800 2019/2020 First Semester: Score 100%

1.3.1.3 TCU 101 2019/2020 First Semester: Score 100%

1.3.2 Trainings in Higher Education

1.3.2.1 7th – 27th September 2021: Application of Solar and Wind Energy. International online Workshop by Gansu National Energy Research Institute

1.3.2.2 14th – 18th June 2021: Leadership, Management and Governance Training. Workshop held at Lake Naivasha Resort. TVETA

1.3.2.3 16th – 29th March 2021: Enhancing Energy Efficiency in East Africa. eTraining by Copenhagen Center on Energy Efficiency

1.3.2.4 9th – 10th January 2019: Resource Recovery from Waste: Regional Scoping Workshop held at Kenyatta University Conference Center

1.3.2.5 25th– 28th June 2018: Integrity Assurance Officers Training at Kenyatta University Conference Center

1.3.2.6 28th - 30th October 2016: Course on 'Beyond Management to Leadership: A Transformative Leadership Programme' at Kenyatta University Conference Center

1.3.2.7 28th September 2016: Intellectual Property Rights Training Workshop held at Business and Student Service Center Kenyatta University

1.3.3 Ongoing Supervisions

1.3.3.1 PhD Supervision

1.3.2.1.1 J98/24446/2013: LUCY K. WANGAI

Research Title; Optimization and Comparison of Production Process for fuel Bioethanol from wet and Dry Coffee pulp for cooking in Rural Kenya
University: Kenyatta University

1.3.3.2 Masters Supervision

1.3.3.2.1 J104/CTY/PT/26827/2013: SIMON KIMUTAI

Research Title: Thermal Performance Optimization of Evacuated Tube Heat Pipe Solar Collector System

University: Kenyatta University

1.3.3.2.2 J104/CTY/PT/26881/19: AGWATI MICHAEL OTIENO

Research Title: Optimization Of Biogas Production from Co-Digestion of Sugarcane Trash Blended with Sugarcane Vinasse

University: Kenyatta University

1.3.3.2.3 J104/33375/15: ISABEL MUSULA MATASYOH

Research Title: Characterization, Evaluation and Performance Optimization of Wheat Straw – Bagasse Blended Fuel Pellets

University: Kenyatta University

1.3.4 Supervision of Postgraduate Students

1.3.4.1 Masters

1.3.4.1.1 J104/30652/2015 VALENTINE WAMBUI

Thesis Title: Modeling, Simulation, and Socio-Economic Analysis of Electricity Development Pathways in Kenya,

University: Kenyatta University

Graduation date: July 2023

1.3.4.1.2 ALUOCH PHILIP ONYANGO

Thesis Title: Productivity performance analysis and improvement in Kenya sugar industry

Case study of South Nyanza Sugar Company Ltd, Awendo

University: Dedan Kimathi. University of Technology

Graduation date: April 2018

1.3.4.1.3 E221-003-0013/2014 JAMES MWANGI WATHIGO

Thesis Title: Investigations on turning AISI 8660 steel using silicon carbide whisker-reinforced ceramic tool

University: Dedan Kimathi. University of Technology

Graduation date: April 2018

1.3.4.1.4 E221-003-011/2012 JOSEPH CHEGE NGUGI

Thesis Title: Quality failure analysis and quality improvement methods in small and medium manufacturing companies

Case study of Shamco Industries Limited

University: Dedan Kimathi. University of Technology

Graduation date: April 2018

1.3.4.1.5 E221-003-0009/2012 JAMES NJOROGE NDUNGU

Thesis Title: Productivity Improvement of the Manufacturing Processes Through Modelling and Simulation Analysis: A Case Study of a Vehicle Assembly Plant.

University: Dedan Kimathi. University of Technology

Graduation date: April 2017

1.3.4.1.6 E221-003-002/2012 REUBEN KIRKUMET

Thesis Title: Analysis and Reduction of Energy Consumption in a Manufacturing Setup: A Case of Farmers Choice Limited

University: Dedan Kimathi. University of Technology

Graduation date: April 2016

1.3.4.1.7 E221-003-0019/2013 GEORGE NJAGI NJERU

Evaluation of asset management practices in TVET institutions in Kenya

University: Dedan Kimathi. University of Technology

Graduation date: April 2016

1.3.4.2 PhD

1.3.4.2.1 J98/33431/14 MACBEN MAKENZI MUTUA

Research Title: “Optimization of Solar Photo-Voltaic Water Pumping System Planning through techno-economic modelling and decision frameworks”

University: Kenyatta University

Graduation date: December 2023

1.4 PROFESSIONAL/CONSULTANCY

1.4.1 Networks/Collaborations

1.4.1.1 June 4th 2021: Appointment as chair to a committee to operationalize the partnership between Kenyatta University and Kenya Urban Roads Authority

1.4.2 Editorial Boards/Referee for professional periodicals

1.4.3 Consulting for international/national boards

1.4.5 Consulting for organizations/institutions

1.4.5.1 July 22nd 2019: Consultancy on Capacity building for Kenya Military Academy (KMA)

1.4.5.2 March 2019: UNDP through NETFUND and Ministry of Environment; Rice Husk Particle Board Project.

1.4.5.3 November 2018: Consultant with Education Development Trust; Development of Accelerated Education Training Manual for the Catch-Up Classroom Teacher

1.4.5.4 October 23rd 2018: Short term consultancy work with Tredgrow Africa to edit TVET CDACC Occupational Standards and Competency Based Curricula

1.4.5.5 September 26th 2015 to October 16th 2015: Consultant with Target Africa; Entrepreneurship and Leadership Skills Training

1.4.6 Membership to acad/prof bodies

1.4.6.1 July 30th 2024 Institution of Engineering Technologists and Technicians of Kenya (IET): Category: Engineering Technologist. **Member no:** 9595

1.4.6.2 August 14th 2024 Kenya Engineering Technology Registration Board (KETRB): Category: Engineering Technologist. **Member no:** C02004

1.4.7 Any other (Editorship/Peer review, external examiner, etc)

1.5 Administrative and Responsibilities

1.5.1 Recognized university administrative positions

1.5.1.1 May 2018 to May 2020: Examinations Coordinator, Energy Technology Department

1.5.1.2 Oct 21st 2014 to April 2017: Digital School Coordinator (School of Engineering and Technology)

1.5.2 Other responsibilities in the University

- 1.5.2.1 **June 4th 2021:** Appointment as chair to a committee to operationalize the partnership between Kenyatta University and Kenya Urban Roads Authority
- 1.5.2.2 **February 7th 2020:** Appointment to resource mobilization subcommittee of the innovation festival 2020
- 1.5.2.3 **December 10th 2019:** Appointment to a committee to develop strategic plan for the Kenyatta University TVET Center
- 1.5.2.4 **May 13th 2019:** Committee to explore the best use of Kenyatta University Kericho Campus after its closure
- 1.5.2.5 **October 2018:** A Committee on proposed Accreditation of Certificate and diploma programs by TVETA Kenyatta University
- 1.5.2.6 **September 2018:** A Committee to Develop a Strategies to Cope with Declining student Population in the University
- 1.5.2.7 **March 2018:** A Committee to organize Kenyatta University School of Education 5th International Annual October Conference on Education and Lifelong Learning
- 1.5.2.8 **July 2017 to March 2020:** Chair School Postgraduate Studies Committee, School of Engineering and Technology
- 1.5.2.9 **June 2016 to March 2021:** Co-coordinator Postgraduate Programs in Department of Energy Technology

1.6 Community Engagements and Other Contributions

1.6.1 Research funding

1.6.2 Community outreach

- 1.6.2.1 **January 18th 2023 to Date:** Member, Board of Governors Mathenge Technical Training Institute
- 1.6.2.2 **November 13th 2019 to Date:** Chairperson Board of Governors Thika Technical Training Institute (Kiambu County)
- 1.6.2.3 **March 18th 2019 to Date:** Member of the Board of Management Uhuru Secondary School (Nyandarua West Sub- County)

1.6.2.4 **January 30th 2019 to Date:** Member Endowment and Alumni Programmes
Directorate Board

- 1.6.3 Professional Affiliation & portfolios
- 1.6.4 Recognitions awards and honours
- 1.6.5 Any other sub-category

1.7 Referee

1. Dr. Francis N. Njoka

Chairman Energy Gas and Petroleum Department

School of Architecture and Engineering

Kenyatta University

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- 2 Dr. Eng. Fidelis Kilonzo

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