

# Dr. Lydia A. Musiga

## Curriculum Vitae

### Personal Data

Address School of Mathematics  
University of Nairobi  
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### Research Interests

- Stochastic Processes
- Continuous Time Markov Chains
- Availability Modelling and Quantification
- Reliability Modelling and Quantification

### Work Experience

2013 - Date **Lecturer**, Mathematical Statistics, University of Nairobi, Kenya.  
2007 - 2013 **Part-time Lecturer**, Mathematical Statistics, University of Nairobi, Kenya.  
1991 - 2013 High School Mathematics Teacher, Nairobi, Kenya.

### Education

2019 **Ph.D in Mathematical Statistics**, University of Nairobi, Kenya.  
Title: *Non-Birth-Death Continuous Time Markov Chain Availability Model with Application to a Hierarchical Engineering System.*  
2007 **M.Sc in Mathematical Statistics**, University of Nairobi, Kenya.  
Title: *Modelling a Hierarchical System with Multiple Absorbing States.*  
1997 **Diploma in Computer Science**, Strathmore College, Nairobi, Kenya.  
1992 **B.Ed (Science) in Double Mathematics Option**, Egerton University, Njoro, Kenya.  
1987 **Kenya Advanced Certificate of Education**, Moi Forces Academy, Nairobi, Kenya.  
1985 **Kenya Certificate of Education**, Moi Forces Academy, Nairobi, Kenya.  
1981 **Certificate of Primary Education**, Kongoni Primary School, Nairobi, Kenya.

## Scholarship, Research Grant and Overseas Postgraduate Research

- 2015 2<sup>nd</sup> February to 31<sup>st</sup> May: **Research Scholar**, Duke High Assurance and Availability Laboratory, Duke University, North Carolina, USA.
- 2015 **USD 2000** Ph.D Research Grant from World Quant Foundation for research work at Duke University, North Carolina, USA.
- 2014 20<sup>th</sup> to 24<sup>th</sup> January: **Research Scholar** at Indian Institute of Technology Gandhinagar, Ahmedabad, India.
- 2013 **Ph.D Scholarship** from University of Nairobi.

## Publications

1. **Saidi J. K. and Musiga L. A.**, Modelling Tuberculosis Treatment Outcomes using a Discrete Time Markov Chain Model, **Submitted on 29th November 2020 in the Kenya Journal of Sciences Series A.**
2. **Muli C. M. and Musiga L. A.**, A Stochastic Model for Predicting Loan Portfolio Performance, **Accepted on 3rd February 2021 in the Kenya Journal of Sciences Series A.**
3. **Musiga L. A., Ottieno J. A. M. and Weke P. G. O.**, Application of Non-Birth-Death Continuous Time Markov Chain Availability Models with Exponentially and Non-Exponentially Distributed Unplanned Outages to Cisco 12000 GSR, **Accepted on 7th November 2018 in the Kenya Journal of Sciences Series A.**
4. **Musiga L. A., Ottieno J. A. M. and Weke P. G. O.**, Non-Birth-Death Continuous Time Markov Chain Availability Models with Exponentially and Non-Exponentially Distributed Unplanned Outages, **Accepted on 7th November 2018 in the Kenya Journal of Sciences Series A.**
5. **Musiga L. A.**, Non-Birth-Death Continuous Time Markov Chain Availability Model with Application to a Hierarchical Engineering System, **Ph.D Thesis**, University of Nairobi, Kenya, 2019.
6. **Musiga L. A.**, Sensitivity Analysis of Cisco 12000 GSR, **Accepted on 18th August 2016 in the Kenya Journal of Sciences Series A.**
7. **Musiga L. A.**, Uncertainty Analysis of the Availability of Cisco 12000 GSR, *Kenya Journal of Sciences Series A*, Vol. 16, No. 2, pp. 47 - 57, 2018.
8. **Musiga L. A.**, A Stochastic Hierarchical System Steady-State Availability Model, *Kenya Journal of Sciences Series A*, Vol. 16, No. 2, pp. 26 - 45, 2018.
9. **Musiga L. A.**, A Stochastic Model for Planning a Compartmental Education System and

- Determining Stable Student Population Distribution, *Kenya Journal of Sciences Series A*, Vol. 15, No. 2, pp. 25 - 38, 2014.
10. **Musiga L. A.**, Owino J. O. and Weke P. G. O., Modeling a Hierarchical System with Multiple Absorbing States, *Kenya Journal of Sciences Series A*, Vol. 15, No. 1, pp. 46 - 53, 2012.
11. **Musiga L. A.**, Owino J. O. and Weke P. G. O., Modeling a Hierarchical System with Double Absorbing States, *Kenya Journal of Sciences Series A*, Vol. 15, No. 1, pp. 39 - 45, 2012.
12. **Musiga L. A.**, Owino J. O. and Weke P. G. O., Modeling a Hierarchical System with a Single Absorbing State, *Kenya Journal of Sciences Series A*, Vol. 15, No. 1, pp. 32 - 38, 2012.

## Conference Presentations

- Oct 2020 12th - 16th, CBPS Annual Research Week, University of Nairobi, Nairobi, Kenya: *Stochastic Modelling of Availability with Application to CISCO 12000 GSR.*
- Aug 2012 22nd - 25th, EAUMP Conference, NMAIST, Arusha, Tanzania: *Markov Modelling of a Compartmental Education System.*
- Apr 2011 20th - 21st, ICABUMPA Conference, KICC, Nairobi, Kenya: *A Discrete Time Markov Chain Model of a System with Double Absorbing States.*
- Aug 2010 25th - 27th, AIBUMA Conference, KICC, Nairobi, Kenya: *A Stochastic Model of a Hierarchical System with a Single Absorbing State.*

## M.Sc Student Supervision

1. Onchwati Felisters Kerubo (2020), *Modelling Cure Rates of Female Sex Workers with STIs using a Mover-Stayer Markov Chain Model*, M.Sc. in Biometry, University of Nairobi.  
**Completed**
2. James Saidi Kamau (2020), *Modelling Tuberculosis Treatment Outcomes using a Discrete Time Markov Chain Model*, M.Sc. in Biometry, University of Nairobi.  
**Completed**
3. Muli Charles Mutiso (2018), *A Stochastic Model for Predicting Loan Portfolio Performance*, M.Sc. in Social Statistics, University of Nairobi.  
**Completed**

## Courses Taught

1. STA 406 - Applied Stochastic Processes
2. STA 410 - Sample Survey Theory
3. STA 420 - Statistics Project
4. SMA 441 - Tests of Hypotheses
5. SMA 444 - Design and Analysis of Experiments
6. FCE 461/FEE 471/FME 471/FEB 316 - Statistics for Engineers
8. SMA 341 - Probability and Statistics II
9. SMA 342 - Theory of Estimation
10. SMA 344 - Sample Survey Theory
11. SMA 241 - Introduction to Probability and Statistics
12. SMA 242 - Probability and Statistics I
13. SMA 101 - Basic Mathematics
14. SMA 104 - Calculus II

## Professional Training and Workshops Attended

- Jun 2020 Focusing on Mathematical Models and Analysis of COVID-19 Crisis, Webinar by Maharaja Sayajirao University of Baroda, India and Lappeenranta University of Technology, Finland.
- Nov 2019 First Regional Workshop On Gender Equality In Stem, University of Nairobi, Kenya.
- Apr 2019 Biostatisticians: Mathematicians with a calling to Medical Research, University of Nairobi, Kenya.
- Apr 2018 Research Grant Proposal Writing Training, University of Nairobi, Kenya.
- May 2017 PhD Supervisors Training, University of Nairobi, Kenya.
- May 2017 Postgraduate Tracking System Training, University of Nairobi, Kenya.
- Feb 2016 Turnitin Antiplagiarism Software Training, University of Nairobi, Kenya.
- May 2014 Pedagogy Training, University of Nairobi, Kenya.
- Nov 2013 Information Security and Public Key Infrastructure Training, University of Nairobi, Kenya.
- Jul 2013 Statistical Modeling in R Workshop, University of Nairobi, Kenya.
- May 2013 Scientific Research Publishing Training, University of Nairobi, Kenya.
- Apr 2006 Training and Research on Pan-African Mathematics Olympiad, Kenya Institute of Education, Kenya.

## Professional Memberships

- Organization for Women in Science for the Developing World, Member No. 10251
- Kenya National Statistical Society, Member No. 00736

## Administrative Responsibilities

- Chair, Outreach Community Service Committee
- Member, Examination Committee
- Member, Resolution of Public Complaints Committee
- Member, 50th Anniversary Committee

## Community Engagement

- Church Member, Nairobi Pentecostal Church, Nairobi.
- School Alumni Member, Moi Forces Academy, Nairobi.

## Referees

1. Prof. J. A. M. Ottieno, Professor of Mathematical Statistics  
School of Mathematics  
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P. O. Box 30197-00100, Nairobi, Kenya  
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2. Prof. M. M. Manene, Professor of Mathematical Statistics  
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4. Prof. K. S. Trivedi, Professor of Electrical and Computer Engineering  
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