

CURRICULUM VITAE



PERSONAL INFORMATION

Dr. Jimrise Ochwach, PhD
Lecturer: Applied Mathematics
Mama Ngina University College
School of Pure and Applied Science
Department of Computing and Information Technology
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ORCID: <https://orcid.org/my-orcid?orcid=0000-0002-6354-8706>

Job Category: Teaching
Birth Date: 08 June 1986
Nationality: Kenyan
Marital status: Married

PERSONAL STATEMENT

I am an Applied Mathematician and researcher specializing in mathematical sciences and their applications across various fields. My research focuses on mathematical modeling and analysis, particularly in the areas of human and plant disease and pest modeling. I am dedicated to conducting research that extends to fluid mechanics, data science, agribusiness, and contemporary issues in education, business, finance, computing, and information technology. The goal of my research is to address real-life socio-economic challenges in Kenya, Africa, and globally.

ACADEMIC QUALIFICATIONS

- 11/2018–12/2021 **Ph.D., Applied Mathematics**
Chuka University-Kenya.
Dissertation: Mathematical Modelling of Host-Pest Interactions in the Presence of Pheromone Traps and Sterile Insects Technique: A Case of False Coding Moth, [*Thaumatotibia leucotreta* (Meyrick)].
- 08/2014–10/2018 **M.Sc., Applied Mathematics**
Chuka University-Kenya
Thesis: Modelling Nitrate Leaching into Groundwater using Advection Dispersion Equation.
- 09/2006–12/2010 **Bed Science (Mathematics and Physics) With IT**
Maseno University-Kenya
- 01/2001–11/2004 **Kenya Certificate of Secondary Education (B Plus)**
Uriri High School (Migori County-Kenya)
- 01/1993–11/2000 **Kenya Certificate of Primary Education (B Plain),**
Wasamo Primary School (Homa Bay County-Kenya)

PROFESSIONAL QUALIFICATIONS

- 1/2022–3/2022 The Data Scientist Toolbox with R
John Hopkins University, Coursera
(<https://www.coursera.org/account/accomplishments/certificate/WVNV93YREV8F>)
- 2/2022–5/2022 Data Science Bootcamp with Python.
Udemy
ude.my/UC-2a9059e4-f7e1-4c1e-8d1e-77646ec9bac1
- 2/2012–12/2013 Certified Public Accountants Part I (CPA I II).
KASNEB
- 1/2011–5/2011 IT Essentials: PC Hardware and Software.
CISCO
- 4/2006–07/2006 Micro-Computer software application.
Goread Library and ICT Services.

FIELDS OF SPECIALIZATION

- (i) Applied Mathematics (Mathematical Modelling of Dynamical Systems -Epidemiological Models, Fluid Mechanics)

- (ii) Data Analysis Skills(SPSS, Python, R)
- (iii) Writing skills , document language (English) editing and contexting skills, and Simulation skills (LaTEX, MATLAB, Python and Mathematica)
- (iv) Computer maintainance, software installation and management skills

UNIVERSITY LEVEL TEACHING EXPERIENCE

- 08/2024–Current **Mama Ngina University College**
Position: Lecturer of Mathematics
Department of Computing and Information Technology
- 01/2023–Current **Tharaka University**
Position: Adjunct Lecturer of Mathematics
Lecturing mathematics; Department of Basic Science
- 09/2018–Current **Chuka University**
Position: Adjunct Lecturer of Mathematics
Lecturing mathematics; Department of Physical Science

OTHER TEACHING EXPERIENCE

- 10/2012–8/2024 **Teacher Service Commission (TSC) -Ikuu Boys High School- Tharaka Nithi**
Position: Mathematics and Physics Teacher.
Teaching Mathematics and Physics
Dean of Studies
- 05/2010–09/2012 **Board of Management Teacher (BoM) -Raila Education Centre-Nairobi**
Position: Mathematics and Physics Teacher.
Teaching Mathematics and Physics

LEADERSHIP AND RESPONSIBILITIES

- 01/2015-08/2024 **Ikuu Boys High School**
Position: Dean of Studies
Project: Analysis and management of academic programmes and Timetable in schools.
- 03/2023–03/2023 **TSC Tharaka Nithi County**
Position: County Trainer of Trainer of Junior Secondary Teachers (JSS)

- Project: Junior Secondary Competency Based Curriculum (CBC) roll out Training
Supervisor: Teachers Service Commission (TSC)
- 03/2018–08/2023 **Chuka University**
Position: Committee Member: Chuka University Ethics Committee
Project: Review of the Standard Operation procedures of the Chuka University Ethics Committee and Carrying out monitoring and evaluation of research protocol in progress
- 05/2022–05/2022 **TSC Tharaka Nithi County**
Position: County Trainer of Trainer
Project: Junior Secondary Competency Based Curriculum (CBC) roll out training
Supervisor: Teachers Service Commission (TSC)
- 09/2008–09/2009 **Students Organisation of Maseno University (SOMU)**
Position: Secretary General
Students' rep in the Senate and council
Linking students' welfare with administration

OTHER EXPERIENCE

- 04/2017-08/2024 **Kenya National Examination Council (KNEC)**
Position: Examiner Physics Paper One
Project: Marking of KNEC Examination
Supervisor: Kenya National Examination Council (KNEC)
- 01/2016–08/2024 **Mincks Group of Schools**
Position: Secretary to the Deans of Studies committee
Project: Coordinate and organise the setting and marking of joint Mincks examinations
- 08/2017, 08/2022 **Independence Electoral and Boundary Commission (IEBC)**
Position: Presiding Officer (PO)
Project: Preside over the general election at the polling station.
- 01/2020–03/2022 **Secondary Education Quality Improvement Project (SE-QIP)**
Position: Trainer of Teachers (ToTs)
Project: World Bank project aimed at teachers in ASAL areas under the school-based teacher support system (SBTSS).
Supervisor: Teachers Service Commission (TSC)
- 07/2019–09/2019 **Kenya National Bureau of Statistics (KNBS)**
Position: ICT Supervisor
Project: 2019 Kenya Population and Housing Census - Tharaka Nithi County. Supervisor: KNBS-Tharaka Nithi County

RESEARCH INTERESTS

- (i) Mathematical Modelling
- (ii) Dynamical Systems-Epidemiological studies
- (iii) Fluid Dynamics
- (iv) Data Science and machine learning

LIST OF PUBLICATIONS IN A REFEREED JOURNAL

Publication As A Lecturer

1. Jason, Jomba, Mark Okongo, Jacob Kirimi, and **Jimrise Onyango**. 2024. Modelling Fluid Flow in Zone 2 of an Open Horseshoe Channel With Lateral Inflow Channels. *Journal of Advances in Mathematics and Computer Science* 39 (8):33-42. <https://doi.org/10.9734/jamcs/2024/v39i81919>
2. Jason, Jomba, Mark Okongo, Jacob Kirimi, and **Jimrise Onyango**. 2024. Modelling Fluid Flow in Zone 1 of an Open Horseshoe Channel With Lateral Inflow Channels. *Journal of Advances in Mathematics and Computer Science* 39 (7):34-44. <https://doi.org/10.9734/jamcs/2024/v39i71910>.

Publication Before Lecturer

1. Obita, B. O., Okongo, M. O., **Jimrise, O. O.**, Lunani, A. M. (2024). Mathematical Modelling for Rice Blast Re-Infection. *American Journal of Applied Mathematics*, 12(2), 37-49. <https://doi.org/10.11648/j.a.jam.20241202.12>
2. Wanjala, H. M., Okongo, M. O., & **Ochwach, J. O.** (2023). Impact of Media Awareness and Use of Face-Masks on Infectious Respiratory Disease. *Pan-American Journal of Mathematics*, 2, 15.
3. **Jimrise O Ochwach**, Mark O Okongo, Alice Lunani M Murwayi (2023). On Basic Reproduction Number R_0 : Derivation and Application. *Journal of Engineering and Applied Sciences Technology*. SRC/JEAST-234. DOI: [doi.org/10.47363/JEAST/2023\(5\)173](https://doi.org/10.47363/JEAST/2023(5)173). <https://www.onlinescientificresearch.com/journal-of-engineering-and-applied-sciences-technology-inpress-jeast.php>.
4. **Jimrise, O.**, Okongo, M., & Muraya, M. (2023). Stability Analysis of a Sterile Insect Technique Model for Controlling False Codling Moth. *Journal of Mathematical Analysis and Modeling*, 4(1), 78-105.

5. Mark O. Okongo, Murwayi A. Lunani, Bathsheba K. Menge, **Jimrise O. Ochwach**. (2023). The impact of HIV/AIDS treatment and counseling on the prevalence of tuberculosis and malaria co infections *International Journal of Mathematical Analysis*, Vol. 17, 2023, no. 2, 51-67doi: 10.12988/ijma.2023.511270
6. **Ochwach Jimrise**, Okongo Mark, Ombaka Ochieng. Mathematical Modelling and Simulation of Nitrate Leaching into Groundwater. *International Journal of Systems Science and Applied Mathematics*. Vol. 7, No. 4, 2022, pp. 74-84.doi: 10.11648/j.ijssam.20220704.12
7. Ngari, C., Ngari, C. G., Okongo, M., **Ochwach, J.** (2022) Mathematical Modelling of Cholera Incorporating the Dynamics of the Induced Achlorhydria Condition and Treatment. *Journal of Progressive Research in Mathematics*, 19(2), 60-88. Retrieved from <http://scitecresearch.com/journals/index.php/jprm/article/view/2168>
8. **Ochwach, J.**, Okongo, M. O., & Muraya, M. M. (2021). Mathematical Model for False Coding Moth Control Using Pheromone Traps. *International Journal of Applied Mathematical Research*, 10(2), 32-52.
9. **Jimrise O. Ochwach**, Mark O. Okongo, Moses M. Muraya (2021) Mathematical Modelling of Host - Pest Interactions in Stage-Structured Populations: A Case of False Codling Moth [Thaumatotibia leucotreta]. *Journal of Progressive Research in Mathematics*, 18(4), 1-21. Retrieved from <http://scitecresearch.com/journals/index.php/jprm/article/view/2087>.
10. **Ochwach, O. J.**, Musundi, S. W. & Okongo, M. O. (2018). Stability analysis of the modified advection-dispersion model for the leaching of nitrates into groundwater. *Journal of Progressive Research in Mathematics* (JPRM) ISSN: 2395-0218. Volume 14, Issue 2.
11. **Ochwach, O. J.**, Okongo, M. O. & Musundi, S. W. (2018). Modelling the Impact of Soil Porosity on Nitrate Leaching to Groundwater Using the Advection Dispersion Equation. *IOSR Journal of Mathematics* (IOSR-JM) Be-ISSN: 2278-5728, p-ISSN: 2319-765X. Volume 14, Issue 4 Ver. II (July - August 2018), PP 18-26 www.iosrjournals.org.

CONFERENCES & INVITED PRESENTATIONS

1. Wanjala, M. H, Okongo M. & **Ochwach J.** (2023, Feb 13-16). The Impact of Home - Based Care on Infectious Respiratory Disease: A Case of Covid-19. Presentation at the annual 14th KEMRI Annual Scientific & Health (KASH) Conference. Safari Park Hotel and Casino.

<https://www.kemri.go.ke/wp-content/uploads/2024/02/14-KASH-ABSTRACT-BOOK-1.pdf>

2. Wanjala, M. H, Okongo M. & **Ochwach J.** (2023, Feb 13-16). Mathematical Model of Covid-19 with A Double-Dose Vaccine. Presentation at the annual 14th KEMRI Annual Scientific & Health (KASH) Conference. Safari Park Hotel and Casino. <https://www.kemri.go.ke/wp-content/uploads/2024/02/14-KASH-ABSTRACT-BOOK-1.pdf>
3. Henry M. Wanjala, Mark O. Okongo, **Jimrise O. Ochwach** (1)COVID-19 2023 Transmission Dynamics Model with Double-Dose Vaccination and Use of Face Masks; A Case Study in Kenya. 10th Chuka University Annual International Conference, 4 October 2023
4. 8th Chuka University Annual International Conference, 4 October 2021.
Title: Mathematical Modelling of the Sterile Insect Technique for Control of False Coding Moth.
5. Seminar paper presented at the Chuka University Department of Physical Sciences in October 2019.
Title: Effect of harvesting and stocking under delayed time regulation on the logistic population model.
6. Seminar paper presented at the Chuka University Faculty of Science, Engineering, and Technology. July 2020.
Title: A Note on the Basic Reproduction Number: Novel Corona virus (2019-Ncov).
7. 5th Chuka University Annual International Research Conference. October 2018.
Title: Modelling Nitrate leaching to Groundwater using a modified diffusion advection equation.

POSTGRADUATE SUPERVISION

POSTGRADUATE SUPERVISION GRADUATED

1. Henry Milimo Wanjala, *Mathematical Modelling of SARS-COV-2 in Kenya Incorporating Non-Pharmaceutical Interventions Coupled with Vaccination*, M.Sc. Applied Mathematics Thesis, Chuka University, **2021-2023**,; Supervisors: Dr. Mark Okongo and **Dr. Jimrise Ochwach**.

POSTGRADUATE SUPERVISION ONGOING

1. Alex Rwanda, *Mathematical Model of Unsteady Micropolar MHD*

- Fluid Flow on Nonlinear Stretching Sheet under Inclined Magnetic Field*, PhD. Applied Mathematics , Chuka University, **2022-To date**: Supervisors: Dr. Mark Okongo, **Dr. Jimrise Ochwach**.
2. Amos Kiugo, *Modelling Locust Plague with Surveillance Treatment on the Breeding Zones*, M.Sc. Applied Mathematics , Chuka University, **2022-To date**: Supervisors: Dr. Mark Okongo and **Dr. Jimrise Ochwach**.
 3. Kimanthi Angela Mbaika, *Modelling the Effect of Stigma in Tuberculosis in the Presence of Counselling*, M.Sc. Applied Mathematics , Chuka University, **2022-To date**: Supervisors: Dr. Mark Okongo and **Dr. Jimrise Ochwach**.
 4. Julius Njiru Nyagah, *Modelling the Dispersion of Air Pollutants in the Atmospheric Boundary layer using a Two dimensional Advection Dispersion Equation*, M.Sc. Applied Mathematics , Chuka University, **2022-To date**: Supervisors: Dr. Mark Okongo and **Dr. Jimrise Ochwach**.
 5. Ngari W. Maureen, *Modelling the Impact of Unemployment and ARV Treatment Literacy on HIV/AIDS Transmission Among Women in Kenya*, M.Sc. Applied Mathematics Thesis, Chuka University , **2021-To date**: Supervisors: Dr. Mark Okongo and **Dr. Jimrise Ochwach**.
 6. Chege Kimani Samuel *Mathematical Modelling of the Control of Alcoholism Incorporating Treatment With Reference to Mount Kenya Counties* , Chuka University, M.Sc. Applied Mathematics Thesis, Chuka University, **2023-To date**: Supervisors: Dr. Mark Okongo and **Dr. Jimrise Ochwach**.
 7. Nicholus Waithaga *Mathematical Modeling of Healthy Cell-Tumor Cell Interactions with Radiotherapy Integration*, M.Sc. Applied Mathematics , Tharaka University , **2024-To date**: Supervisors: **Dr. Jimrise Ochwach** and **Jason Jomba** .

POSTGRADUATE EXAMINATION OF THESIS

1. Grace Makena Njoka , *Modelling of Predictors of Diabetic Kidney Disease Among Diabetic Patients* , Msc. Applied Statistics Thesis, Chuka University: Supervisors: Prof Moses M. Muraya and Dr. Elizabeth W. Njoroge, September, 2024: INTERNAL EXAMINER.

MEMBERSHIP IN PROFESSIONAL BODIES AND SOCIETIES

1. Kenya National Statistical Society (KNSS), Membership number:1589621
2. Mathematics Association of Kenya (MAK).
3. The Applied Malaria Modeling Network (AMMnet)

COMMUNITY SERVICE

1. A secretary to the Development committee of Full Gospel Church-Karandini, 2022 to date
2. Member of the Ikuu boy educational outreach program.
3. Member of the Chuka University Great Lakes welfare group.
4. Teacher trainer in the School-Based Teacher Support System (SBTSS) 2020.
5. ICT supervisor, Kenya Population and Housing Census, 2019.
6. Polling Official in 2007, 2013, 2017, 2022, General Elections in Kenya.
7. Volunteer teacher of Physics and Mathematics at Nyarach Secondary School, February 2008 to April 2008.
8. Participated in a clean-up exercise in Lwanda on 24 February 2007 organised by the RED CROSS Maseno chapter.
9. Participated in a community cleanup exercise organised by the Kenyan Red Cross Maseno chapter at Nyanza Provincial Hospital community cleanup exercise organised by the Kenyan Red Cross Maseno chapter on 8th June, 2008.
10. Participated in the Maseno University community clean-up exercise organised by SOMU on 28 February 2007.

WORKSHOP & TRAINING

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|------|---|
| 2024 | Attended a workshop on Malaria modelling using R-Software to develop skills in Combating malaria within the Kenyan Context between 29th-30th August, 2024 |
| 2020 | Education Technologist for School-Based Teacher Support System (SBTSS) Training Workshop, 29 January 2020 to 1 February 2020 at Kitui TTC. |

- 2019 Curriculum design training workshop for Senior School (grade 10-12) for physics and physical sciences, December 16-20 at KICD Nairobi.
- 2019 ICT Supervisor training and use of computer-assisted personal interviews (CAPI) for the 2019 Kenya Population and Housing Census, 24th July-1st August 2019 at the Kenya School of Government- Embu.
- 2017 KNEC examiner training for Physics paper 1, 24 April 2017 to 29 April 2019. at State House Girls at State House girls-Nairobi.
- 2016 Participated in the 2016 Chuka Igambangombe sub-county secondary sport training 2016 as a rugby coach on 27 February 2016 at Ikuu Boys High School-Tharaka nithi county.
- 2015 Participated in Meru South District Physics and Mathematics workshop held at Magumoni Girls Secondary in 2nd June 2015.
- 2014 SMASE Secondary District Insert Training 2014 at Chuka Girls Secondary School at Chuka Girls High School from August 25, 2014, to August 29, 2014.
- 2014 Student leadership seminar at Strathmore University on 31 July 1 August 2009.
- 2013 Participated in Meru South District Physics Workshop held at Chuka Girls Secondary on 23rd May 2013.
- 2009 Attended a workshop on Gender Mainstreaming held at Maseno University on 31st July 1st August 2009.
- 2009 Attended training on life skills held at Maseno University, by I choose life Kenya from 13th to 15th March 2009.
- 2009 Attended as peace leader training at Maseno University on 13th march 2009.
- 2007 Attended Disaster management training presented by the Kisumu chapter of KENYA RED CROSS held at Maseno University from 24th March to 1st April 2007.
- 2007 Attended training in HIV/ AIDS Peer Educator Course organised by I chose Life Africa held at Maseno University, 14th November 2007.
- 2007 Attended training on Community based first aid organised by Kenya Red cross Society held at Maseno University, April 2007

Awards & Achievements

2023	Appreciation of the service of the Regional Games Championship Committee, Eastern Region term two 2023 championships held at Machakos Boys High School.
2022	Appreciation of the service of the Regional Games Championship Committee, Eastern Region term one 2022 championships held at Kangaru Boys High School.
2019	Appreciation of the service of the County Games Championship Committee, Tharaka Nithi County term one 2019 championship held at Chuka Boys High School.
2018	Trained[2018] Trained and coached rugby players of 15 and 7 players at the regional level and achieved positions 5 and 4, respectively, at the Eastern Region Games Championship, held in 2018 at Kangaru School and Kitui School, respectively.
2018	Trained and coached rugby 15s and 7s to the county level and reached positions 2 and 1, respectively, in 2018.
2015	Pioneered and organised the 1st Ikuu Boys mathematics contest in 2015.
2018	Trained and coached rugby 15s and 7s players to the sub-county level and reached positions 1 and 1, respectively, in 2018 at Chogoria Girls.
2016	Participated in the Kenya National Music Festival held in Nairobi on 17th August 2016.
2017	Coordinator of Energy Transport at Meru South District Science & Engineering Fair in 2017 on 17th to 18th March 2017.
2016	Junior coach at the regional secondary school term one championship (HIGHRESSSA) and attained 3rd position, on 22nd -27th Mach 2016.
2013	Merit certificate during education day for attaining a mean score of 9.052 and being position ONE in physics in the Meru South Sub County in the 2013 KCSE.
2013	Chief Technical Advisor for the 51st National Kenya Science & Engineering Fair, held from 13 to 15 May 2013 at Kisii High school.
2013	Overall best physics teacher in Tharaka Nithi County, achieving a mean score of 9.052 in 2013 KCSE.
2009	Team Manager of Maseno University teams to East Africa Inter-University Games held in 2009 Uganda, 3rd February to 8th February 2009.
2009	Team Manager of Maseno University teams to East Africa

Inter-University Games held in 2009 Uganda, 3rd February to 8th February 2009.

PERSONAL INTERESTS

Travelling, Reading novels, spiritual and motivational books; coaching rugby

LANGUAGES

Luo (native)

English

Kiswahili

Kimeru(Basic)

Abasuba (Basics)

REFERENCE

Dr. Mark Okongo (Msc & Ph.D. advisor)

Position: Senior Lecturer at Chuka University

Institute: Chuka University

Department: Department of Physical Sciences

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Mobile: +254726322466

Email: marikookongo@gmail.com k

Prof. Moses Muraya (Ph.D. Co-advisor)

Position: Director Post Graduate Studies

Institute: Chuka University

Address: P.O Box 109-60400-Chuka

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Email: Moses.muraya@gmail.com

*[CV compiled on September 19, 2024 for the position of Lecturer in Applied
Mathematics]*

Gatundu - Kenya, September 19, 2024