

## CURRICULUM VITAE

### 1.1 Personal Profile

#### 1.1.1 Personal Details

Name: Dr. Isaac Chepkwony

PF. No.: 5879

Department: Mathematics and Actuarial Science

Designation: Lecturer

Email: [chepkwony.isaac@ku.ac.ke](mailto:chepkwony.isaac@ku.ac.ke), [ichepkwony@gmail.com](mailto:ichepkwony@gmail.com)

Mobile No.: 0710-146518

#### Area of specialization:

- Applied Mathematics

#### Research Interests:

- Control theory
- Distributed parameter systems
- Mathematical modeling
- Fractional order differential equations

#### 1.1.2 Academic & Professional Qualifications

Iowa State University of Science and Technology, Iowa, U.S.A

Ph.D. in Applied Mathematics December, 2006

University of Nairobi, Nairobi, Kenya

Master of Science in Mathematics December, 1996

University of Nairobi, Nairobi, Kenya

B.SC December, 1994

#### 1.1.3 Employment History

Lecturer January 2006- to date

Department of Mathematics

Kenyatta University

Tutorial Fellow, Kenyatta University 1998- 2006

Graduate Assistant, University of Nairobi 1997-1998

#### 1.1.4 Achievements

- Acting chairman 16<sup>th</sup>-20<sup>th</sup> May 2016
- Acting chairman 15<sup>th</sup>- 19<sup>th</sup> July 2013
- Acting chairman 23<sup>rd</sup> March- April 14<sup>th</sup> 2013
- Departmental Exam coordinator 1<sup>st</sup> May 2010- 1<sup>st</sup> May 2014
- Successfully supervised 2 PhD students.
- Successfully supervised over 18 masters students.
- Published 7 papers in a peer reviewed journals.
- Successfully done teaching methodology course.
- BOG Member- Marumbasi secondary School, Kericho

## 1.2 Publications

### 1.2.1 Refereed journals

David, K., M. & Isaac, C. *Modelling of Shear Banding in Plane Couette Flow of Viscoelastic Fluids*. **International Journal of Advances in Scientific Research and Engineering (Ijasre)** 2020, 6(2): 119-133 DOI:10.31695/IJASRE 2020.33735.

Miriam, M & Isaac, C. *Effects of temperature on applying variable pressure gradient to a magneto-hydrodynamic fluid flowing between plates with inclined magnetic field*. **Journal of multidisciplinary science and technology (JMEST)** 2019, 6(11): 11022-11027.

Mutuguta, J., Rotich, T. & Chepkwony, I. *Mathematical modeling of the transmission dynamics of measles under the effect of vaccines*. **IOSR Journal of Mathematics (2019), 15(4) :10-19.**

Joy Mutegi, Iyaya Wanjala, Isaac Chepkwony. *Application of fractional calculus to Euler- Poisson-Darboux Equation (EPD)*. **International Journal**

**on Future Revolution in computer Science & Communication Engineering (2019)** ISSN 2454-4248, Vol 5(6): 70 – 83.

Faith, K. & Chepkwony, I. *Mathematical modeling of Tuangiasis disease dynamics incorporating hygiene as a control strategy. Journal of advances in Mathematics and Computer Science (2019)*, 33(5):1-8.

Mutuguta John, Rotich Titus, Chepkwony Isaac. *Dynamics of Ebola Epidemic in West Africa*. 2014 Mathematical Theory and Modeling ISSN 2224-5804(paper) ISSN 2225-0522(online) DOI: 107176/MTM Vol 9(2), 2019.

I., Wanjala, I., Chepkwony, S. Wattanga, J., Mutegi & G., Mocheche. *On generalized Caputo and Katugampola derivatives*. Pioneer Journal of Mathematics and mathematical sciences ISSN 2230-9829, Vol. 24(2), pp 65-72, 2018.

Iyaya Wanjala, Isaac Chepkwony, Sitawa Wattanga & Joy Mutegi. *Applying transmutation method to solve Euler-Poisson-Darboux Equation on  $(0, \infty)$* . Pioneer Journal of Mathematics and mathematical sciences ISSN 2230-9829, Vol. 24(1), pp 15-30, 2018.

I., Wanjala and I., Chepkwony. *Solutions of generalized Euler-Poisson-Darboux Equation and their properties*. Journal of physical science and environmental studies Vol 2(3), pp 38-45, 2016.

A.W. Ndegwa, M.M. Kimathi, M.N. Kinyanjui and I. Chepkwony. *Mathematical Modeling of Water Flow for Irrigation in a Permeable Pipe of Elliptical Cross-section*. British Journal of Mathematics and Computer Science ISSN: 2231-0851 Vol 5(2):133-158, 2015.

Chepkwony, S. Hansen. *Distributed controllability of a cochlea model*. Proc. MTNS (2008).

### 1.3 **Quality teaching, learning and mentorship**

#### 1.3.1 **Student evaluation**

My students' evaluation score is over 80%.

#### 1.3.2 **Trainings in Higher Education**

I have successfully done teaching methodology course which covered teaching methodology, setting examination, administration of examinations, marking and analysis of scores.

### 1.3.3 Ongoing Supervisions

#### PhD Supervision

1. Fwamba Rukia (I84/37346/2017)  
**Title:** Image processing using Partial differential Equations
2. Miriam Malia (I84/28150/2018)  
**Title:** mathematical modeling of the spread of HBV infection and its impact on immunization.

#### Masters Supervision

1. Faith Kabura (I56/33500/2015)  
**Title:** Mathematical Modelling of Tungiasis Disease Incorporating Protection and Treatment as Control Strategies: A Cases Study of Murang'a County.
2. Mary Chepngeno (I56/CE/25953/2014)  
**Title:** Dynamics of a fractional order HTLV-1 model with both cell-to-cell transmissions and mitosis.
3. Jane Musaili (I56/37892/2017)  
**Title:** Mathematical modeling of Rabbits transmission dynamics in dogs incorporating public health as a control strategy.

### 1.3.4 Postgraduate Supervision

#### 1.3.4.1 Masters

1. Phyllis Macharia (I56/34130/2016), Graduated, 2018  
**Title:** The impact of a transverse magnetic field on blood flowing through an axi-symmetric curved shaped stenotic artery
2. Miriam Malia (I56/37634/2016), Graduated 2018  
**Title:** Determination of the effects of applying variable pressure gradient to a Magneto-hydrodynamic fluid flowing between plates with inclined magnetic field.
3. Fwamba Nasimiyu Rukia, I56/NKU/CE/25493/2011 (Graduated in 2016)  
**Title:** Survey and applications of reaction Diffusion equations to real life.
4. Chebet Irene Melly Graduated, 2015  
**Title:** Mathematical modeling of Tumor growth: An investigation of breast cancer growth.
5. Muthamia Julius Mwendwa (I56/26155/2011)  
**Title:** A study of propagation of cracks in two dimensional elastic medium occupying a bounded domain.

6. Weldon Kiplangat (I56/31902/2015), Graduated 2019  
**Title:**
7. Zachary Kipkoech Kemei, I56/NKU/CE/20523/2012 (Graduated in 2016)  
Title: Mathematical modeling of solute contaminant transport in fluid phase through a porous medium.
8. Wesley C. Koech (Graduated in 2013)  
Title: Controllability and stabilization of a channel with wave generators.
9. Peter Githinji Mwangi, I56/CE/13980/2009 (Graduated in 2012)  
Title: An analysis of Magneto Hydrodynamic fluid flow in slider bearing.
10. Chwala W. Kennedy, I56/CE/10969/2006 (Graduated in 2011)  
Title: Adomian Decomposition method on solving the Sturm-Liouville Eigenvalue problem.
11. Kamau Clement Wainaina (Graduated in 2007).  
Title: Non-dissipative Boundary stabilization of a canal with wave generators.
12. Cheres Robert Kibet (Graduated in 2008)  
Title: Exact Boundary Controllability of two Euler Bernoulli Beams connected by a point mass
13. Otieno Esther Ochieng (Graduated in 2010)  
Title: Exact controllability of the heat equation with nonlinear terms with Dirichlet boundary conditions.
14. Hyldrew Ameka Ombwayo, I56/CE/13979/2009 (Graduated in 2012)  
Title: Analysis of Hydrounsteady magnetic viscous flow through a porous channel with parallel plates.
15. George Omollo Gose, I56/CE/11350/2008 (Graduated in 2012)  
Title: Modeling fluid flow in open channel with Lateral discharge.
16. Gate Francis Kariuki, I56/CE/10332/2004 (Graduated 2007)  
Title: Approximation methods for control of structural Acoustics with Piezoceramic actuators.
17. Millicent Akong'o Ogutu, I56/CE/11358/2008 (Graduated in )  
Title: Hydromagnetic flow through a channel with parallel porous plates.

#### 1.3.4.2 PhD

##### Completed:

1. Ambrose Wahome Ndegwa (I84/24527/2011), Kenyatta University, Graduated 2016

**Title:** Mathematical modeling of fluid flow in a porous pipe of elliptic cross section.

2. Magua Amos Ngang'a (I84/25459/2011), Kenyatta University. Graduated 2015

**Title:** Simulating the effects of Dam breakage on the downstream Topography: Morphological Evolution of Mounds and a Furrow.

#### 1.4 **Professional/consultancy**

- January 2019 to date: Member, South African Mathematical Sciences Association (SAMSA).
- December 2010- Reviewed Mathematics Program at Depaul University/Tangaza College B.A Degree program, Cohort III.
- Supervised a Catholic University of Eastern African MSc. Student Ojwando Constance Atieno (1019613)- Graduated at CUEA in 2013

#### 1.5 **Administrative and Responsibilities**

- Departmental Examinations Coordinator  
Mathematics Dept. 1<sup>st</sup> May 2010- May 2014
- Acting chairman 16<sup>th</sup>-20<sup>th</sup> May 2016
- Acting chairman 15<sup>th</sup>- 19<sup>th</sup> July 2013
- Acting chairman 23<sup>rd</sup> March- April 14<sup>th</sup> 2013
- Member of Departmental AD-HOC committee on new programs
- Member of Departmental strategic plan committee

#### 1.6 **Community Engagements and other contributions**

- March 2019 to date: Member of the board of management, Marumbasi Secondary School, Kericho.
- Participated in the planning and organization of the Second Kenyatta University Workshop on Mathematical Modeling, 2017 held at Kenyatta University from 12<sup>th</sup> June to 16<sup>th</sup> June 2017.
- Participated in the planning and organization of the First Kenyatta University Workshop on Mathematical Modeling, 2013 held at Kenyatta University from 17<sup>th</sup> June to 21<sup>th</sup> June 2013.
- Participated in the planning and organization of the First Kenyatta University International Mathematics conference,

2011 held at Kenyatta University, from 8<sup>th</sup> to 10<sup>th</sup> June 2011.

#### 1.6.4 Recognitions awards and honours

- Research Excellence Award: Iowa State University of Science and Technology, December 2006
- Graduate Teaching Excellence Award: Iowa State University of Science and Technology, December 2004

#### 1.6.6 Conferences/ Workshops

- Attended The Third Kenyatta University International Mathematics Conference-2019 held at Kenyatta University, from 17<sup>th</sup> to 20<sup>th</sup> June 2019.
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- Attended and participated in the Second Kenyatta University Workshop on Mathematical Modeling, 2017 held at Kenyatta University from 12<sup>th</sup> June to 16<sup>th</sup> June 2017.
- Attended and participated in the First Kenyatta University Workshop on Mathematical Modeling, 2013 held at Kenyatta University from 17<sup>th</sup> June to 21<sup>th</sup> June 2013.

### 1.7 REFEREES

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