Dr. Okaka Colleta Akinyi ,
Department of Mathematics
School of Applied and Natural Sciences
Senior Lecturer, Masinde Muliro University of Science and Technology
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PROFILE

Dr Colleta Akinyi Okaka Holds a doctorate degree in Applied Mathematics specializing in Biomathematics. Her areas of research interest are in mathematical modelling of the dynamics of infectious diseases. Her major contribution has been her research on the dynamics of misdiagnosis and treatment of other common infectious diseases as malaria, which helped in creating awareness on proper and intensive diagnosis of infectious diseases that initially present with similar symptoms. She is also a holder of post-graduate diploma (project planning and management) and also trained in leadership. She has greatly contributed towards promotion of both primary and secondary education in the local communities with emphasis on girl child education.

She is currently a senior lecturer at the university engaging in lecturing and, supervision of students and research work. She was the departmental school of graduate studies chairperson from June 2014 to January 2022, overseeing and coordinating post-graduate student's progression in their research, thesis writing and publications. She also gives introductory lectures and group research to final year under graduate students who also publish their work. She acted as a chairlady of the department of a staff of 22 (technical and support) running administrative and technical duties.

CURRICULUM VITAE

QUALIFICATIONS
- PhD in Applied Mathematics (Maseno University- 2014)
- Masters of applied Mathematics (Maseno University- 2005)
- Bachelor of Science Education (Kenyatta University- 2002)

- Postgraduate Diploma in Project Planning and Management (University of Nairobi-2009)
- Diploma in Science Education (Kenya Science Teachers College- 1989)

EDUCATION/ COLLEGE TRAINING
2007-2014 MASENO UNIVERSITY - PhD in Applied Mathematics
2008 July- 2009 September: UNIVERSITY OF NAIROBI
Postgraduate Diploma in Project Planning and Management
2002 September- 2005 December: MASENO UNIVERSITY
Full time Postgraduate- student- Masters in applied Mathematics. I did course work and thesis by research on mathematics of combat (war).
1998- 2002: KENYATTA UNIVERSITY- UNDERGRADUATE TRAINING.
Bachelor of Science Education (Mathematics and Chemistry)
1987 May- 1989 May: KENYA SCIENCE
Diploma in Science Education (Mathematics and Chemistry and Library Science and Environmental Science)
1984- 1985: A level Lwak girls' high school. Sat for (Kenya Advanced Certificate of Education (KACE) and passed with two principals and one subsidiary- mathematics C, Further Maths- E, Chemistry-O, general paper 3.
1980-1983: Loreto Limuru secondary school, sat for Kenya certificate of education (KCE 'O' level) examination and passed with Division 1
1973- 1979: Ugunja Primary School, sat for certificate of primary education (CPE) and passed with 35 points

PROFESIONAL EXPIRIENCE.

April 2021 to date: Senior lecturer, Masinde Muliro University, dept. of Mathematics.
2008 June to April 2021: Lecturer, Masinde Muliro University, dept. of Mathematics
2006- 2008: Part time lecturer, Maseno University, dept. of Mathematics and Applied Statistics.
2005 Jan: Lecturer, posted to Kisumu Polytechnic.
2002 September- 2005 December: Post graduate training-Masters in Mathematics.
1989- 2002: Taught at the following secondary schools; Nyamira girls' sec. school, Lwak girls' high school and Kisumu day secondary school.
1989- Employed by Teachers' service commission

DUTIES/ RESPONSIBILITIES.
MASINDE MULIRO UNIVERSITY
- Lecturing Applied Mathematics
- Organizing research topics, supervision and publication of findings with the undergraduate, postgraduate students and own research.
- Supervision of Postgraduate students (maters and Ph.D students)
- Faculty representative to HIV/AIDS Board
- Departmental timetable/examination coordinator
- Departmental representative to School of Graduate studies.
- Acting departmental chair person

KISUMU POLYTECHNIC

☐ Teaching Mathematics and Computer science.

☐ Member Kisumu Polytechnic women group- sensitizing the lady students to achieve their goals (in college and home- Academically and socially).

☐ Sensitizing the girl child education in the rural primary schools.

KISUMU DAY SECONDARY SCHOOL

☐ Teacher of Mathematics and Chemistry.

☐ School timetable planner.

☐ Science club coordinator

☐ Class teacher - involved in guidance and counseling.

☐ Math's club patron.

PUBLICATIONS

1. Okaka C. O., Predictive Model on Dynamics of Natural Ecosystem and Organic Foods as Effective Prevention and Control Measures against Covid-19 Infection.(Applied Mathematical Sciences. Hikari) (2020):
2. Oganga D.O., Lawi G. **O.,** Okaka C. A., Analysis of a Multiscale Model of Ebola Virus Disease.(Asian Research Journal of Mathematics). (2020) Vol.16 (6) 53 – 69.
3. Oganga D.O., Lawi G. **O.,** Okaka C. A., Stability Analysis of Endemic Equilibriumof an Ebola disease Model.(Applied Mathematical Sciences. Hikari). (2019) Vol.13 (21) 1001 – 1012.
4. Okaka C. O., Mathematics of Community Public Health Education on Hepatitis B Virus infection Transmission Control.(Applied Mathematical Sciences. Hikari). (2019). Vol.13 647 – 662.
5. Makwata H., Lawi G., Akinyi C., Adu W., Analysis of a Fishery model with a depensation term.(International Journal of Statistics and Applied Mathematics)vol:4 (2019) 44-49.
6. Makwata H., Lawi G., Akinyi C., Adu W., Stability and Bifurcation of a Fishery Model with Allee Effects. (Mathematical Modelling and Applications, Science Publishing Group), vol: 4(2019)1-9
7. Tireito K. F., Lawi O. G., Okaka A. C., Mathematical Analysis of HIV/AIDS Anti-Retroviral Treatment Incorporating Adherence.(Asian Research Journal of Mathematics)10(2): (2018) 1-13.
8. Owade K.J., Akinyi C. O., Owuor G. L., Modelling the role of Rehydration and Antibiotic Treatment on Reduction of Cholera Mortality.(IOSR Journal of Mathematics), vol.14, (2018) 11-21.
9. Tireito K. F., Lawi O. G., Okaka A. C., Mathematical Analysis of HIV/AIDS Prophylaxis Treatment Model. (Applied Mathematical Sciences.Hikari L.td), vol, 12 (2018) 893-902.
10. Waswa S. Nyongesa S., Akinyi C. Tireito K. F.,Estimation of baby weights at birth using generalized inverse regression model and its application to prenatal care data. International Organization of Scientific Research journal of Mathematics .vol:13 (2017)
11. Okaka C. A., Tireito F., Mwita D., Kigen J., Kwanya J., Mathematical Model on the Effect of Hospital Admission for HIV infected individuals on the rate of transmission and Mortality. Internatioonal Mathematical Forum Vol 11, no. 19: 905-923; 2016

12. Olege F., Okaka C. A.,Perfect Repetition Codes of Ideals of the Polynomial Ring $F_2{}^n[x]$ $mod(x^n-1)$ for Error Control In Computer Applications: Journal of Mathematics and Statistical Science. (2016), 579-605.
13. Olege F.,Owino M. O., Aywa S., Okaka C. A.,Characterization of Codes of Ideals of the Polynomial Ring $F_2{}^{30}[x]mod(x^{30}-1)$ for error control in computer applications;Journal of Advances in Mathematics, vol,12(5), 6238-6247; 2016
14. Nthiri J. K., Lawi G. O., Okaka C. A., Oganga D. O., Muriuki C. W., Musyoka M., J., Otieno P.,O., Koech L. Mathematical Modelling of Typhoid fever disease Incorporating Protection against Infection, (British journal of Mathematics and Computer Science) 14(1) 1-10, 2016.
15. Okaka C.,A., Mugisha J. Y. T., Ouma C. A model on the Impact of treating Typhoid with Anti-malarial: Dynamics of Malaria Concurrent and Co-infection with Typhoid, (International journal of Mathematical analysis) vol. 9, 542-551, 2015
16. Okaka C.,A., Mugisha J. Y. T., Ouma C. Modelling the Impact of Misdiagnosis and Treatment on the Dynamics of Malaria Concurrent and Co-infection with pneumonia, (Journal for Theory and Applications: Applied Mathematical Sciences), vol. 7, 6275-6296, 2013
17. TEXT BOOK: Okaka C. A. (2017): A Model on Misdiagnosis of Pneumonia as Malaria. Published by Lambert Academic Publishing. ISBN:978-3-330-32118-2.
18. Kwach O. B., Ongati O., Olambo O. D.,Okaka C.A., Derivation and solution of heat equation in 1-D (International Journal of Engineering, Science and Mathematics. Research Academy IJMRA, 129, New Grain Marker Jagadhri_135003, Yamunn Wegar, India), vol.2, (2013) 213-218
19. Manyonge A.W., Okaka C.A., Nyambane H. Mathematics of war; Guerilla versus guerilla combat (war) model.(Journal of Mathematical Sciences, International centre for Advanced Studies (India) vol.22 No. 1 (2011) 1-6

CONFERENCES ATTENDED
1. The 24th conference of Applied and Industrial Mathematics (CAIM) 2016 15th -18th September 2016-Romania.
2. Leadership course "Managing from the Inside Out" by Impact Kenya. 2016 23rd – 25th August
3. The second Strathmore International Mathematics Conference Nairobi (Kenya). August 12th - 16th, 2013
4. First Kenyatta University International Mathematics Conference, "The Role of Mathematics as a tool for development 8th – 10th June, 2011.
5. Kenya Inter-University Council for Mathematics and Computer Science conference, June 2009-Maseno University.
6. East African Mathematics conference 2006 and Mathematical Biology. 4th – 10th December 2006, Nairobi Kenya.

PAPERS PRESENTED IN CONFERENCE
1. Modeling the Impact of Misdiagnosis and Treatment on the dynamics of Malaria concurrent and Co-infection with Pneumonia at the 24th conference of Applied and Industrial Mathematics(CAIM) 2016 15th -18th September 2016.
2. Mathematics of war –Guerilla versus Guerilla combat (war) model at the East African Mathematics conference 2006 and Mathematical Biology. 4th – 10th December 2006, Nairobi Kenya.

RESEARCH WORK DONE

Modeling the Impact of Misdiagnosis and Treatment on the dynamics of Malaria concurrent and Co-infection with Pneumonia at Kisumu referral and Jaramogi Oginga Odinga referral hospital, when doing my PhD at Maseno University.2013-2014. Funded by NACOSTI.

ON GOING RESEARCH

Hepatitis B virus modelling in children from the ages 3-10 years.

WORKSHOPS ATTENDED AND PARTICIPATED IN

1. University multiplication training implementation and Accreditation held in Kakamega Kenya 23rd-24th January 2014.
2. curriculum development, review and implementation for the faculty of science held in MMUS on 24th June 2014.
3. Transition, Change and Impact Awareness Training for Implementers (Based on ISO 9001-2015) on 23rd - 25th August 2018 in MMUST Kakamega Kenya.

POSTGRADUATE STUDENTS SUPERVISION

1. Fanuel Olege :   PhD Pure Mathematics ;(MMUST) "On the Generators of Codes of Ideals of the Polynomial Ring $F^N_2[x]/(x^N-1)$"……………Graduated in 2017.
2. Owade Kennedy: MSc Applied Mathematics (MMUST) "Modelling the Role of Rehydration and Antibiotic treatment on Reduction of Cholera Mortality"…………. Graduated in 2018.
3. Franklin Tireito: PhD. Applied Mathematics (MMUST) "Mathematical Analysis of an HIV/AIDS model incorporating adherence, prophylaxis use and diffusion"……………Graduated in 2018.
4. Makwata Harun: PhD. Applied Mathematics(MMUST) "Dynamics of fishery model with allee effects in population growth"……Graduated in 2019.
5. PhD Student- Oganga D.O. (Completed, awaiting graduation).
6. PhD Students – Owade Kennedy. Is in the process of writing his proposal

PROFESSIONAL AND SOCIETY MEMBERSHIP/AFFILIATIONS

1. Member of American Mathematical Society (AMS).
2. African Women in Science and Engineering (AWSE).

COMMUNITY DEVELOPMENT WORK

1. Member of Board of Management(BOM) Bishop Okoth Ojolla Girls' Sec. School, Kisumu West sub-county

3. Member of Board of Management (BOM) Sirandumb Primary school, Ugunja sub-county
4. Talks to high school students and primary school pupils to encourage them to complete their education and to help them set the right targets and achieve those targets.
5. Economic education and economic empowerment to women in women groups to enable them to keep their children and in particular the girl child in school. And to take back the girls who drop out due to pregnancy back to school. This I do through IMPACT KENYA INITIATIVE forum.

PERSONAL PROFILE
Sex: Female

Date of Birth: 28th/August/1965
Marital Status: Married
Languages: English, Dholuo, Kiswahili

REFEREES.
1. PROF. JOHN AGURE OGONJI
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MASENO UNIVERSITY,
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