

# College of Biological and Physical Sciences

## School of Biological Sciences

### Introduction

The School of Biological Sciences (SBS) is set in a serene environment at Chiromo Campus, located about 2 km from Nairobi City. It offers training in three well-structured undergraduate degree programs, as well as MSc. and PhD. programs in over 12 bioscience specialty areas. The School is structured into the following eight thematic areas; each with a thematic head:

- |  |                                   |
|--|-----------------------------------|
| i) Microbiology, Parasitology and Immunology | v) Marine and Fisheries           |
| ii) Genetics and Biotechnology               | vi) Ethnobiology and Taxonomy     |
| iii) Ecology and Environmental Sciences      | vii) Physiology and Biochemistry  |
| iv) Insect Science                           | viii) Biological Natural Products |

The School is involved in different types of researches within the biological arena and has links with several local, regional and international institutes. Besides teaching and research, the School offers other services to the public and private sector, and the general public such as consultancies in many biosciences areas, taxonomic identification of plants and animals, and sale of biological products, such as seedlings, mice and insects, among others.

### Programmes Offered

The School offers three undergraduate degree programmes, namely:

- i) BSc. (Biology)
- ii) BSc. (Environmental Conservation & Natural Resource Management)
- iii) BSc. (Microbiology and Biotechnology)

### Student Enrolment

#### Undergraduate

Degree Program	Total
BSc. (Biology)	357
BSc. (Microbiology & Biotechnology)	676
BSc. (Environmental Conservation & Natural Resource Management)	482
<b>Total</b>	<b>1,515</b>

#### Postgraduate

Programmes	Number of Students Enrolled
MSc. Agricultural Entomology	3
MSc. Applied Parasitology	4
MSc. Biology of Conservation	11

MSc. Cell Biology and Physiology	1
MSc. Genetics	4
MSc. Hydrobiology (Aquaculture)	4
MSc. Medical & Veterinary Entomology	2
MSc. Microbiology	6
MSc. Plant Physiology & Biochemistry	1
<b>Total</b>	<b>36</b>

## International Student

Degree Program	Number of Students Enrolled
BSc. (Microbiology & Biotechnology)	4
BSc. (Environmental Conservation & Natural Resource Management)	2
Postgraduate (MSc)	3
Postgraduate (PhD)	2
<b>TOTAL</b>	<b>11</b>

## Number of Graduands

Degree Program	No. of Graduands
BSc. (Biology)	67
BSc. (Microbiology & Biotechnology)	69
BSc. (Environmental Conservation & Natural Resource Management)	135
MSc.	11
PhD.	6
<b>Total</b>	<b>288</b>

## National and International Links and Collaborations

Title	Industry Partners
Training and Scientific Research and University of Nairobi	North East Forestry University (NEFU), Harbin, P.R. China
Kamuthanga Farm Ltd and The University of Nairobi	Kamuthanga Farm Ltd
NARA Institute of Science and Technology, Japan and The University of Nairobi	NARA Institute of Science and Technology, Japan
Yokohama National University (YNU), Japan and The University of Nairobi	Yokohama National University (YNU), Japan
City university of Mogadishu, Somalia and The University of Nairobi	City university of Mogadishu, Somalia

## Publications

Author*	Title	Journal
D. Odongo et. al	The Rhipicephalus appendiculatus tick vector of Theileria parva is absent from cape buffalo (Syncerus caffer) populations and associated ecosystems in northern Uganda	Parasitology Research <a href="https://doi.org/10.1007/s00436-020-06728-x">https://doi.org/10.1007/s00436-020-06728-x</a>
David O. Odongo et. al	Equid infective Theileria cluster in distinct 18S rRNA gene clades comprising multiple taxa with unusually broad mammalian host ranges	Parasit Vectors. 2020; 13: 261 doi: 10.1186/s13071-020-04131-0 PMID: 32430015
Odongo D. O et. al	Multilocus genotyping of Theileria parva isolates associated with a live vaccination trial in Kenya provides evidence for transmission of immunizing parasites into local tick and cattle populations	Transboundary and Emerging Diseases 2020 Mar; 67 Suppl 1:88-98. doi: 10.1111/tbed.13417. PMID: 32174043
Bishop RP, Odongo D et. al	A review of recent research on Theileria parva: implications for the infection and treatment vaccination method for control of East Coast fever	Transboundary and Emerging Diseases 2020 Mar; 67 Suppl 1:56-67. doi: 10.1111/tbed.13325. PMID: 32174044
Odongo D, Bishop RP, Skilton RA, et. al	Antigen gene and variable number tandem repeat (VNTR) diversity in Theileria parva parasites from Ankole cattle in southwestern Uganda: evidence for conservation in antigen gene sequences combined with extensive polymorphism at VNTR loci	Transboundary and Emerging Diseases 2020 Mar; 67 Suppl 1:99-107. doi: 10.1111/tbed.13311. PMID: 32174038
Odongo D, Kuiate JR, et. al	First detection of Theileria parva in cattle from Cameroon in the absence of the main tick vector Rhipicephalus appendiculatus	Transboundary and Emerging diseases 2020 Mar; 67 Suppl 1:68-78. doi: 10.1111/tbed.13425. PMID: 32174039
Daniel Nthiwa, David Odongo et. al	Seroprevalence of foot-and-mouth disease virus in cattle herds raised in Maasai Mara ecosystem in Kenya	Preventive Veterinary Medicine 2020 Mar 13;176:104929. Epub 2020 Feb 13
Virginia V. Wang'ondur	Mangrove Degradation: Reversing the trend through community engagement	©2020 Authors Published by Office of DVC Research, Innovation and Enterprise, <a href="https://uonresearch.org/journal/kpb">https://uonresearch.org/journal/kpb</a> University of Nairobi, <a href="http://www.uonbi.ac.ke">http://www.uonbi.ac.ke</a>
Nathan Gichuki Catherine Lukhoba et. al	Medicinal Plants of the Maasai of Kenya: A Review.	Plants, 9, 44; ( <a href="https://doi.org/10.3390/plants9010044">https://doi.org/10.3390/plants9010044</a> ).
Nathan Gichuki Catherine Lukhoba et. al	Sustainability of the Loita Maasai Childrens' Ethnomedicinal Knowledge	Sustainability, 11(19), 5530; ( <a href="https://doi.org/10.3390/su11195530">https://doi.org/10.3390/su11195530</a> ).

Author*	Title	Journal
Catherine Kitonde Judith Odhiambo et. al	Morphological Traits as Indicators of Bitterness in Traditional Vegetables: The Case of Spider Plant ( <i>Gynandropsis gynandra</i> ) in Kenya	Asian Journal of Research in Botany, 2(3): 1-15.
Catherine Kitonde Catherine Lukhoba et. al	In vitro studies of 3-O-Methylquercetin against phytopathogenic fungi of major cereals	Journal of Agricultural Science and Practice Volume 4(4), pages 102-112, August 2019 Article Number: CF2BA5C52 ISSN: 2536-7072 <a href="https://doi.org/10.31248/JASP2019.145">https://doi.org/10.31248/JASP2019.145</a> <a href="https://integrityresjournals.org/journal/JASP">https://integrityresjournals.org/journal/JASP</a>
Catherine Kitonde Catherine Lukhoba Maina Wagacha	Effect of Vernodalol, a Sesquiterpene Lactone, on Economically Important Agricultural Fungi.	International Journal of Innovative Science & Research Technology, 4 (3): 685–694
David Odongo et. al	Theileriosis in mountain Bongo repatriated to Kenya: a clinical and molecular investigation	Journal of Zoo and wildlife medicine Vol.50,issue 2, pgs 342-349
David Odongo et. al	Assessment of the prevalence of <i>Theileria lestoquardi</i> in sheep from the Sudan using serological and molecular methods	Journal of Preventive Veterinary Medicine Vol. 169, pgs 104697
David Odongo et. al	A participatory epidemiology study of major cattle diseases amongst Maasai pastoralists living in wildlife-livestock interfaces in Maasai Mara, Kenya	Journal of Tropical Animal Health and Production. pp 1-7
David Odongo et. al	Molecular identification of zoonotic hookworms in dogs from four counties of Kenya.	Journal of helminthology. pp 1-8, Cambridge University Press
Nathan Gichuki et. al	Woody species composition in upper Tana River flood plain of Kenya: potential effects of change in flood regimes	Journal of Sustainability, Environment and Peace Vol. 1 issue 3, pp 91-97
Joyce Kanini Omari	Woody species composition in upper Tana River flood plain of Kenya: potential effects of change in flood regimes	Journal of Sustainability, Environment and Peace Vol. 1 issue 3, pp 91-97
George Ong'amo	Decanal as a major component of larval aggregation pheromone of the greater wax moth, <i>Galleria mellonella</i>	Journal of Applied Entomology Vol. 143, issue 4 pgs 417-429

Author*	Title	Journal
Florence A. Oyieke et. all	Larval species diversity, seasonal occurrence and larval habitat preference of mosquitoes transmitting Rift Valley Fever and Malaria in Baringo County, Kenya.	Journal of parasites & vectors. Vol. 12, Issue 1, pp 295. By BioMedical Central.
Wolfgang Richard Mukabana	Artisanal fishing supports breeding of malaria mosquitoes in Western Kenya	Malaria Journal Vol. 18, issue 1 pp 77 by BioMedical Central.
John Maina Wagacha	Influence of socio-economic and agronomic factors on aflatoxin and fumonisin contamination of maize in Western Kenya	Journal of Food Science & Nutrition
Mary Mwangi et. all	Insights into the diet and feeding behaviour of Red-capped lark <i>Calandrella cinerea</i> (Aves: Passeriformes: Alaudidae)	Journal of threatened taxa Vol. 11, issue 6 pp 137217-13733
Sheila Okoth et. all	Activation of the p38/MAPK pathway regulates autophagy in response to CYPOR-dependent oxidative stress induced by zearalenone in porcine intestinal epithelial cells	Journal of food and chemical toxicology Vol. 131, Sept. 2019, 110527
Sheila Okoth et. al	Curcumin-based photosensitization inactivates <i>Aspergillus flavus</i> and reduces aflatoxin B1 in maize kernels	Journal of food microbiology Vol 82, issue 0740-0020 pp. 82-88
Francis Mwaura et. al	Biosynthesis of silver Nanoparticles from <i>Eucalyptus Corymbia</i> leaf extract at optimized conditions	Journal of Thermodynamics & Catalysis 8 (1), 5 -Nano hybrids and composites vol. 25 pp 32-45, by Trans Tech Publications
Robert Chira	Insights into the diet and feeding behaviour of Red-capped Lark <i>Calandrella cinerea</i> (Aves: Passeriformes: Alaudidae)	Journal of Threatened Taxa
Evans Mwangi	Seasonal abundance of <i>Plutella xylostella</i> (Lepidoptera: Plutellidae) and diversity of its parasitoids along altitudinal gradients of the eastern Afrotropics	Phytoparasitica
Paul Ndegwa et al	Decanal as a major component of larval aggregation pheromone of the greater wax moth, <i>Galleria mellonella</i>	Journal of Applied Entomology Vol. 143, issue 4 pp 417-429
H. Ochanda	A search for snail-related answers to explain differences in response of <i>Schistosoma mansoni</i> to praziquantel treatment among responding and persistent hotspot villages along the Kenyan shore of Lake Victoria	The American journal of tropical medicine and hygiene
Mwaura B. Francis	Silver–zinc oxide nanocomposite antiseptic from the extract of <i>Bidens pilosa</i>	SN Applied Sciences

Author*	Title	Journal
Mwaura B. Francis	Bacteriophages Isolated in China for the Control of Pectobacterium carotovorum Causing Potato Soft Rot in Kenya	Virologica Sinica
Lucy Irungu Paul N. Ndegwa	Species composition, phenotypic and genotypic resistance levels in major malaria vectors in Teso North and Teso South Subcounties in Busia County, Western Kenya	Journal of Parasitology Research
Paul N. Ndegwa Valentine ngowi	Potential effects of Climate Change on Tritrophic Interactions in Crucifer Farming Systems of Mount Kilimanjaro and Taita Hills	ICIPE digital repository
Sheila Okoth et. al	Preharvest Management Strategies and their Impact on Mycotoxigenic Fungi and Associated Mycotoxins in the book title: Mycotoxins impact and management strategies by Patrick Berka Njobeh	eBook (PDF) ISBN:978-1-83881-848-7
Francis Mwaura et. al	Screening of Kenyan Soybean Cultivars For Resistance to different Races of Phakopsora Pachyrhizi (Soybean Rust) and Determination of Molecular Basis or rust Resistance	Journal of food and chemical toxicology Vol. 131, Sept. 2019, 110527
Sheila Okoth et. al	Occurrence of Fungi and Mycotoxins in Fish Feeds and their impact on Fish Health	International Journal of Microbiology
Sheila Okoth et. al	Effects of aflatoxin B <sub>1</sub> on reproductive performance of farmed Nile Perch	International Journal of Veterinary Science and Medicine
Sheila Okoth et. al	Genetic Profiling of Aspergillus Isolates with varying Aflatoxin production potential from different Maize-Growing regions of Kenya	Toxins journal MDPI
Sheila Okoth et. al	Correction: Mitema, A. et al. The Development of a qPCR Assay to measure Aspergillus flavus Biomass in maize and the use of a biocontrol strategy to limit Aflatoxin production.	Toxins journal MDPI,11,179
Sheila Okoth et. al	Aflatoxin Binders in Foods for Human Consumption-can this be promoted safely and ethically?	Toxins journal MDPI
Sheila Okoth et. al	Curcumin-based photosensitization inactivates Aspergillus flavus and reduces aflatoxin B <sub>1</sub> in Maize kernels	Science direct: Food Microbiology

Author*	Title	Journal
Sheila Okoth et. al	Activation of the p38/MAPK pathway regulates autophagy in response to the CYPOR-dependent oxidative stress induced BY Zearalenone in porcine intestinal epithelial cells	Food and Chemical Toxicology
Sheila Okoth et. al	Infestation mechanisms of two woodborer species in the mangrove <i>Sonneratia alba</i> J. Smith in Kenya and co-occurring endophytic fungi	PLOS ONE: <a href="https://doi.org/10.1371/journal.pone.0221285">https://doi.org/10.1371/journal.pone.0221285</a>
Richard W. Mukabana	Artisanal fishing supports breeding of malaria mosquitoes in western Kenya	Malaria Journal
George Ong'amo et. al	Pathogens, endosymbionts, and blood-meal sources of host seeking ticks in the fast-changing Maasai Mara wildlife ecosystem	Journal of Medical Entomology
Sheila Okoth et. al	Influence of growth temperature on thermal tolerance of leading foodborne pathogens	Journal of Food Science and Nutrition
Sheila Okoth et. al	Preharvest Management Strategies and their Impact on Mycotoxigenic Fungi and Associated Mycotoxins	Journal of Applied Biosciences
E. Ndegwa et. al	Longitudinal Shedding Patterns and Characterization of Antibiotic Resistant <i>E. coli</i> in Pastured Goats Using a Cohort Study	Antibiotics MPDPI
Richard W. Mukabana	A Guide to Biological Control of Fall Armyworm in Africa Using Egg Parasitoids	International Journal for Parasitology
Richard W. Mukabana	Seasonal abundance of <i>plutella xylostella</i> (Lepidoptera: <i>plutellidae</i> ) and diversity of its parasitoids along altitudinal gradients of eastern afro-montane	International Journal for Parasitology
Wagacha Maina et. al	Nutrient characteristics of swine manure and waste water	Journal of Agricultural, Biological, and Environmental Statistics
George Ong'amo et. al	Do parasitoids reduce cereal losses? Estimating the impact of parasitoids on stem borer pest infestation and maize yield	Journal of Applied Biosciences

## Major Achievements in the Year 2020

- i) Increased enrolment of postgraduate students in the School.
- ii) Increased number of PhD graduates from the School.
- iii) Increased completion rates of postgraduate students
- iv) Increased publication output

- v) Increased collaborative research projects
- vi) Online lectures and examinations conducted successfully
- vii) Online meetings and trainings conducted successfully
- viii) Interviews for various positions conducted online
- ix) Established and equipped an Aquaculture Laboratory.
- x) Revived the School's Insectary.

### Staff Establishment

Job Title	No. in Position
Professors	6
Associate Professors	5
Senior Lecturers	14
Lecturers	8
Assistant Lecturers	2
Tutorial Fellows	4
Assistant Registrar	1
Chief Technologist	6
Secretary	1
Administrative Assistant	1
Senior Technologist	11
Technologist	3
Registry Clerk	1
Technical Assistant	1
Trainee Technical Assistant	1
Driver	1
Technical Assistant	1
Subordinate Staff	1
<b>TOTAL</b>	<b>68</b>

## School of Computing and Informatics

### Introduction

The School of Computing and Informatics (SCI) was formally established in 1977 as the Institute of Computer Science whose mandate included academic as well as University ICT services. In the year 2002, and in the interest of realizing more focused management and efficiency of the two functions, ICS was split into two units i.e. ICTC and SCI. The School takes its name from the core competencies that it seeks to nurture: *Computing*, to cover the theory and science of computation and *Informatics* to exemplify the practical outworking of this theory in technology and application. The School is a regional leader in research, research and development (R&D) and advanced education in computing. It was the first to offer Bachelors and Postgraduate degrees in Computer Science in the region.

Our objective in teaching and learning is to produce high quality, well-rounded, sophisticated graduates who are productive, innovative, and capable of lifelong learning. Our courses are therefore developed and delivered to a high standard of educational and technological competence.

We aim to institute a dynamic programme of aggressive research in our core areas of competence: information systems, distributed systems and artificial intelligence, in line with national and regional priorities.

### Consultancy

We seek to engage productively with the public and private sector to solve problems of national or organizational economic importance in order to foster progress in our environment. A number of our academic staff members are involved in consultancy work through UNES.

### Research and Development and Extension Services

Based on sound research, relevant teaching, and problem-solving experience gained through consultancy opportunities, we develop training programmes, policies, methodologies and information technology software and hardware products for the local, regional and international market and increase awareness of the same in the community at large.

### Thematic Areas

The research mandate of the School of Computing and Informatics is carried out under three research groups in the following thematic areas:

- i) ICT for development (ICT4D)
- ii) Computational Intelligence
- iii) Distributed Computing

### Programmes Offered

Programmes	Summary
<b>Diploma in Computer Science BSc. Computer Science</b>	It Started in 1993. This is the School's flagship programme. Continues to attract high caliber students. We admit a second class at Kenya Science Campus in addition to the class based in Chiromo Campus. Curriculum has been reviewed 5 times. Most recent review in 2019 March.

<b>MSc. Computational Intelligence</b>	This is an evening programme targeting applicants with first degree in Computer Science or related Engineering, Mathematics or Statistics discipline. Mode of study is coursework and project. Curriculum is currently under review. It started in 2013.
<b>MSc. Distributed Computing Technology</b>	This is an evening programme targeting applicants with first degree in Computer Science or a related discipline (e.g. Engineering, Mathematics and Physics). Mode of study is coursework and project. Curriculum is currently under review. It started in 2013.
<b>MSc. Information Technology Management</b>	This is an evening programme targeting applicants with first degree in Computer Science or Information Technology or a related discipline. Mode of study is coursework and project. Curriculum is currently under review. It started in 2013.
<b>PhD. Information Systems, PhD. Computer Science</b>	These are PhD. purely by research. The program was reviewed in May 2019 and its course work and Research. The programmes have produced 24 graduates so far. Currently over 60 students are registered. It started in 2000.

## Undergraduate Enrolment

Year of Study	Government Sponsored	Privately Sponsored	Totals
1	47	50	97
2	45	92	137
3	33	86	119
4	34	53	87
<b>Total</b>	<b>159</b>	<b>281</b>	<b>440</b>

## Postgraduate Enrolment

### Masters

Year of study	MSc. IT Management	MSc. Computational Intelligence	MSc. Distributed Computing Technology	Total
1	24	33	15	72
2	50	29	23	102
<b>Total</b>	<b>74</b>	<b>62</b>	<b>38</b>	<b>174</b>

### PhD

Level	Male	Female	Total
1	16	5	21
2	17	6	22
3	22	7	29
<b>Total</b>	<b>55</b>	<b>18</b>	<b>72</b>

## International Student Component

During the year 2020, the School had 16 international students.

### Number of Graduates

Degree Programmes	Total
Diploma in Computer Science	36
BSc in Computer Science	63
MSc in Information Systems	1
MSc in Computer Science	4
MSc. IT Management	25
MSc Applied Computing	4
MSc Computational Intelligence	7
MSc Distributed Computing Technology	16
PhD. Computer Science	2
<b>Total</b>	<b>158</b>

### Research Projects

Title	Partners
Health IT Project	USAID
Digital Matatus	Costworld Foundation
HIV Capacity building (UNITID)	UNITID
Africa Climate Change Leadership Program (AFRICLP)	Institute of research Assessment (IRA, IDRC)
Quantifying the contribution of forage technology adoption and advise on policy targets under the Kenya Climate Smart Agriculture Strategy	KALRO
Data Center Management, Maintenance and Support Services	KeeRA

### Publications

Author	Title	Journal	Month & Year
Frankline Makokha, Christopher K. Chepken, and Elisha T. Opiyo	A Comparative Study of a Client Based Vendor Neutral Cloud QoS Monitoring Tool and Cloud Providers' Platform Integrated QoS Monitoring Tools	EJECE, European Journal of Electrical Engineering and Computer Science	January 2020
Benard Mutisya Nzyoka Nzyoka, David Muchangi Mugo, Stephen Mburu Ng'ang'a	Medical Device Integration with Electronic Health Records: A Case Study of University of Nairobi Health Services, Kenya	International Journal of Computers & Technology	January 2020

Author	Title	Journal	Month & Year
Grace Leah Akinyi and Robert Oboko	Proposed Self-Regulation Model for Collaborative E-Learning Systems in Kenyan Public Universities	American Journal of Engineering and Applied Sciences	January 2020
Eric Araka, Elizaphan Maina, Rhoda Gitonga and Robert Oboko	Research trends in measurement and intervention tools for self-regulated learning for e-learning environments—systematic review (2008–2018)	Research and Practice in Technology Enhanced Learning	2020
Rachael Njeri Kibuku, Prof. Daniel Orwa Ochieng and Prof. Agnes Nduku Wausi	e-Learning Challenges Faced by Universities in Kenya: A Literature Review	The Electronic Journal of e-Learning	February 2020
David Gureya, João Neto, Reza Karimi, João Barreto, Pramod Bhatotia, Vivien Quema, Rodrigo Rodrigues, Paolo Romano, Vladimir Vlassov	Bandwidth-Aware Page Placement in NUMA Systems	34th IEEE International Parallel & Distributed Processing Symposium (IPDPS)	March 2020
Kevin Obiero, Ted Lawrence, Jessica Alves, Stephanie Smith, Friday Njaya, Robert Kayanda, Herwig Waidbacher, Dan Olago, Evans Miriti, R.E.Hecky	Advancing Africa's Great Lakes research and academic potential: Answering the call for harmonized, long-term, collaborative networks and partnerships	Journal of Great Lakes Research	February 2020
Kwale F.M., Wagacha P.W. and Kahonge A.M.	A Clustering Accuracy Comparison Framework	African Journal of Education, Science and Technology	March 2020
Boniface Akuku, Timothy Mwololo Waema and Robert Oboko	Institutionalization of knowledge management strategies in agricultural research organizations: a systematic literature review	Knowledge Management for Development Journal	March 2020
Walter Buyu, Elisha O. Abade	Forensic Analysis of Dropbox Data Remnants on windows 10	International Journal of computer Application	July 2020
Michael M Kangethe, Elisha O, Abade	Dynamic Directional NxN Chart Based Text Based Substitution Cipher	Journal of Computer Science and Applications	September 2020

Author	Title	Journal	Month & Year
Michael M Kangethe, Robert Oboko	Association Rankings Model for Cellular Surveillance Analysis	Journal of Computer Science and Applications	July 2020
Simon Kihui, Elisha Abade	Comparative Analysis of Distinctive Features of the Ransomware tactics in Relation to other Malware	International Journal of Computer	July 2020
Justin M Njeru, Elisha O, Abade	A Survey on Big Data Analytics Architecture for Urban Transport System: A case for Nairobi Metropolitan	International Journal of computer Application	September 2020
John Onyiego, Odira Elisha Abade	Supervisory Control and Data Acquisition(SCADA) System Forensics Based on the Modbus Protocol	International Journal of Computer	August 2020
Boniface Akuku, Timothy Mwololo Waema and Robert Oboko	Institutionalization of knowledge management strategies in agricultural research organizations: a systematic review of the international literature	Knowledge Management for Development Journal	September 2020.
Jecinta Muthoni Ndungu, Christopher A. Moturi	Determinants of Mobile Fintech Update in Kenyan Microfinance Sector	Current Journal of Applied Science and Technology	September 2020
Wanjiku Nganga, Ikechukwu Achebe	Spoken word Corpus and dictionary definition for an African language	Journal data Mining and digital Humanities	August 2020
Dennis M. Muriuki, Lawrence G. Muchemi	A Recommendation System for retail Banking products	African Journal of Mathematics and Computer Science Research	September 2020
Veronicah Owino, Timothy Waema	Digital Transformation as A Source of Competitiveness among Small and Medium Enterprises in Nairobi City County, Kenya	Journal of Business and management	August 2020
Erick O. Otieno, Agnes N. Wausi, Andrew M. Kahonge	Exploring the Factors That Contribute Towards Information Security Policy Compliance Culture	Information and Knowledge Management	August 2020
Edward Buhasho, Agnes Wausi, James Njihia	Business Intelligence Capability, Complementary Resources and Performance among Public Listed Firms in Kenya	Information and Knowledge Management	August 2020

Author	Title	Journal	Month & Year
Noel K. Joseph, Peter M. Macharia, Paul O. Ouma, Jeremiah Mumo, Rose Jalang'o, Peter W. Wagacha, Victor O. Achieng, Eunice Ndung'u, Peter Okoth, Maria Muñiz, Yaniss Guigoz, Rocco Panciera, Nicolas Ray & Emelda A. Okiro	Spatial access inequities and childhood immunization uptake in Kenya	BMC Public Health	September 2020
Christopher Moturi; Geofrey Ogoti	Strengthening technology risk management in mobile money lending	International Journal of Financial Services Management	October 2020
Charles Lwande, Robert Oboko & Lawrence Muchemi	Learner behavior prediction in a learning management system	Educ Inf Technol	November 2020
Edwin O. Ngwawe, Elisha O. Abade, Stephen N. Mburu	Context-Aware Computational Trust Model for Recommender Systems	EJECE, European Journal of Electrical Engineering and Computer Science	November 2020
Erick. O. Otieno, Agnes N. Wausi, Andrew M. Kahonge	A Theoretical Model for Information Security Policy Compliance Culture	International Journal of Applied Information Systems	September 2020

## Links/Collaborations/Partnerships

Partners	Details	Duration
KALRO	Quantifying the contribution of forage technology adoption and advise on policy targets under the Kenya Climate Smart Agriculture Strategy	2020 - 2021
USAID	Providing support to the sustaining use of District Health Information System II in Kenya Program	September 2020 to September 2021
Costworld	Supporting Digital Matatu Project	September 2020 to September 2021
Pompeu Fabra University Spain	Mobility for learners and staff	2020-2021
KeRRA	Data Center Management, Maintenance and Support Services	2020-2021

## Staff Portfolio

Designation/Grade	No of Staff
Professor	3
Associate Professor	4
Senior Lecturer	8
Lecturer	4
Tutorial Fellow	4
Senior Administrative Assistant	1
Senior Secretary	1
Network Engineer	1
Senior Technologist	2
Technologists	2
Library Assistant	1
Record Clerk	1
Cleaners	1
Driver	1
<b>Total</b>	<b>34</b>

## Other Events

### Huawei Awards



A third year student at the School of Computing and Information, Maluki Muthusi, was awarded the first prize for winning in the global Huawei ICT Competition in the network track. This is a skill-based competition involving hands-on experience in computer networks and network security. Over 109 teams from Asia, Europe, Southern, and Eastern Africa participated in the global finals. A total of 327 students managed to get to the global finals out of the 150,000 who had registered for the competition. The award ceremony that took place on January 18, 2020, at Serena Hotel, Nairobi and was presided by the PS for Education, Amb. Simon Nabukwesi, who reiterated the government's commitment to nurture ICT skills among the youths. The student later presented the prize to the Vice-Chancellor Prof Stephen Kiama.

## Machine Learning with Azure Event on 19<sup>th</sup> February 2020

### Azure is Microsoft's Cloud Computing Platform



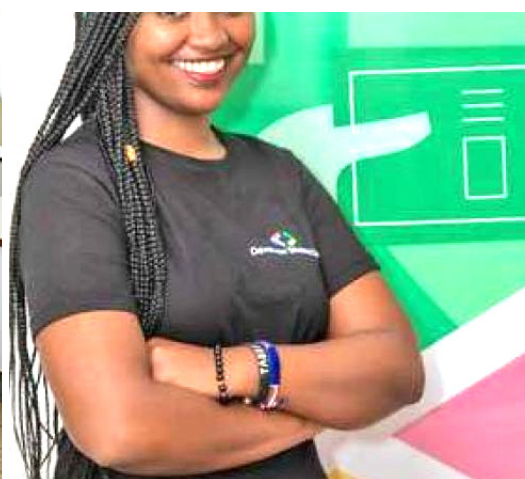
Microsoft student partner clubs are on-campus clubs around the world that seek to empower and help grow the local community through technology. On the afternoon of Wednesday February 19, 2020 from 2pm to 4 pm, the Microsoft student partners club at the University of Nairobi held an Azure fundamentals workshop.

Azure is Microsoft's cloud computing platform where one is able to deploy and build their applications. An introduction to azure and hosting of an application using azure app service was done during the workshop.

Students with their student emails were able to access the student azure student's account. An Azure for Students subscription includes \$100 in Azure credits to be used within the first 12 months plus select free services without requiring a credit card at sign-up.



*SCI student selected as the University Developer Students Club lead*



*Thabitha Kavyu*

Thabitha Kavyu, a third year student at the School of Computing and Informatics, was selected to be the Google Developer Students Club Lead of the University of Nairobi for the 2019 - 20 year. She is part of an amazing community of student leads who will be representing hundreds of colleges and universities across the globe. Her role is to help fellow students become competent software developers. She also trains them on the basics of coding by organizing events where students get to learn about emerging technologies such as Web, Android, Cloud and Artificial Intelligence. The position also entails bringing together women who are passionate about technology, and give them a platform to interact and learn from other successful women.

## School of Physical Sciences

### Department of Chemistry



#### Introduction

The Department of Chemistry is located in Chiromo Campus, Off-Riverside Drive. It is part of the School of Physical Sciences, College of Biological and Physical Sciences. The Department has over 1000 students' comprising of PhD, MSc and undergraduate including servicing the School of Pharmacy, Engineering, Agriculture and Education. The Department is headed by Prof John M. Onyari as the Chairman since August 17, 2015.

In the 2019/2020 academic year, the Department handled about 700 BSc. undergraduates and BSc. ODL (Analytical and Industrial Chemistry 46), 34 MSc. and 7 PhD. students. In addition, we handled a total of about 603 students from other schools and faculties, which includes College of Architecture and Engineering (Civil, Mechanical and Bio Systems Engineering), College of Agriculture and Veterinary Services (Agriculture and Veterinary Medicine), College of Health Sciences (Pharmacy) and College of Education & External Studies CEES (Kenya Science Campus). These students were served by 70 staff members. In this period, we offered three (3) undergraduate and four (4) postgraduate programs.



*Dept. of Chemistry Group photo*

## Programmes and Services Offered

The Department offers the following undergraduate and postgraduate degree programs:

### Undergraduate Programs

1. BSc. in Industrial Chemistry
2. BSc in Chemistry
3. BSc in Analytical Chemistry
4. MSc Industrial chemistry

### Postgraduate Programs

1. MSc in Chemistry
2. MSc in Environmental Chemistry
3. MSc. in Analytical Chemistry

### PhD

1. Doctor of Philosophy in Chemistry
2. Doctor of Philosophy in Environmental Chemistry

## Number of Students Enrolled

### Undergraduate Program

Programme	No. of Students
Bachelor of Science in Chemistry	115
Bachelor of Science (Industrial Chemistry)	71
Bachelor of Science (Analytical Chemistry)	44
<b>Total</b>	<b>230</b>

### Postgraduate Program

Programme	No. of Students
MSc (Environmental Chem.)	10
MSc (Analytical Chemistry)	8
MSc (Chemistry)	9
<b>Total</b>	<b>27</b>

### Doctor of Philosophy

Programs	No. of Students
PhD (Environmental Chem.)	1
PhD (Chemistry)	2
<b>Total</b>	<b>3</b>

**International Students:** The Department hosts 14 international students undertaking postgraduate programs.

## Graduates per Program

The table below shows the number of students per program in the year 2020.

BSc in Chemistry	BSc Industrial Chemistry	BSc Analytical Chemistry	MSc in Chemistry	MSc Industrial Chemistry	MSc Environmental Chemistry	MSc. Analytical Chemistry	PhD in Chemistry	Total
37	47	21	5	2	3	4	5	124

## Strategic Issues

### Research Facilities in the Department

The department conducted trainings and provided consultancy services to various clients from both Public and Private sectors. The major clients included Pest Control Products Board, KEWI, Nation Media, various Universities on application of GC/MS, HPLC, FTIR, AAS, UV/Visible, as well as emissions measurements etc.

The Department acquired Magritek Spinsolve 60NMR, Spectrometer



*Spin solve 60 NMR, Spectrometer*

The National Research Fund – Kenya (NRF-K) has awarded the Department of Chemistry, University of Nairobi **KSH 42,796,236** to establish a Kenya National Nuclear Magnetic Resonance (NMR) Centre (KNMRC). The center is to provide services by analyzing samples using NMR spectrometers for researchers and postgraduate students from various universities and research institution. NMR is the single most important analytical tool for identification of unknown compounds. In this regard, the Department of chemistry has acquired a brand new 60MHz Nuclear Magnetic Resonance Spectrometer (**Magritek Spinsolve 60 NMR, Germany**) at a cost of **KSH 11,072,727.80** from the NRF-K grant and the instrument is already installed, staff trained and is functional. This instrument is capable of analyzing  $^1\text{H}$ ,  $^{13}\text{C}$  and  $^{19}\text{F}$ , both one-dimensional and two-dimensional spectra, which will substantially improve the teaching, research and consultancy capability of the department. We are highly grateful to the National Research Fund – Kenya for the award of the Infrastructure Development Grant, and the University of Nairobi for facilitating and handling of the grant.

The Department also has a Physical Chemistry laboratory with capacity to do various analyses and specialized equipment such as bomb calorimeter, GC, HPLC and Ion Chromatograph that has also increased the scope of analyses. The Department has specialized laboratory for analysis of water, air, natural products, biodiesel and fuels, amongst others samples.

### **GAS Chromatograph Mass Spectrometry (GC/MS) Equipment**



*Atomic Absorption Spectrometer (AAS)*

The equipment is important in analysis of heavy metals in environmental samples such as water, soil and sediment; and industrial samples. The AAS is also important in teaching undergraduate and postgraduate students undertaking units in spectroscopic methods of analysis. It has also been used to support analysis of postgraduate research on heavy metals. The equipment can be used for analysis of heavy metals: Cd, Cu, Pb, Fe, Hg, Mg, Mn, Ni and Zn.



*AAS Machine*

## Research Activities

The Department's supervisors led in supervision of 30 PhD and 36 Masters projects in various fields.

## International Links and Collaborations

As part of efforts to promote innovation and technology transfer, the Department linked and collaborated with the following:

Title	Industry Partners	Details	Duration
University industry cooperation anchored on Science, Technology, Engineering and Mathematics.	Memorandum of cooperation between university of Nairobi & MCA group (Manuel Couto Alves group)	University – industry cooperation anchored on science, technology engineering and mathematics. The purpose of the cooperation is to enhance the capacity of both institutions' to fulfill their corporate objectives through educational and industrial engagements.	5 years

## Publications

The Department produced the following Journal publications in the year 2020.

Author	Title	Journal	Date
Hilda Dinah Kyomuhimbo, Immaculate Nyambura Michira, Francis B. Mwaura, Solomon Derese, Usisipho Feleni, Emmanuel I Iwuoha	Silver–zinc oxide nanocomposite antiseptic from the extract of <i>Bidenspilosa</i>	SN Applied Sciences Volume: 1 Issue: 7 Pages: 681 Publisher: Springer International Publishing	1 <sup>st</sup> July 2019
Rahab W Kamau, Jacob O Midiwo, Quintino A Mgani, Veronica M Masila, Leonidah K Omosa, Regina N Bwire, Melissa R Jacob, Frank T. Wiggers, Ilias Muhammad	Oleanolic Acid and other Compounds Isolated from <i>Cordia africana</i> Lam which Inhibit Vancomycin Resistant <i>Enterococcus</i> .	Pharmacognosy Communications Volume: 9 Issue: 3 DOI: 10.5530/pc.2019.3.19	1 <sup>st</sup> July 2019
Victor Kuete, Leonidah K Omosa, Jacob O Midiwo, Oğuzhan Karaosmanoğlu, Hülya Sivas	Cytotoxicity of naturally occurring phenolics and terpenoids from Kenyan flora towards human carcinoma cells	Journal of Ayurveda and Integrative Medicine Volume:10 Issue:3 Pages: 178-184 <a href="https://doi.org/10.1016/j.jaim.2018.04.001">https://doi.org/10.1016/j.jaim.2018.04.001</a>	1 <sup>st</sup> July 2019
R Mogwasi, DK Kariuki, MZ Getenga, V Nischwitz	Comparison of aqueous and enzymatic extraction combination with sequential filtration for the profiling of selected trace elements in medicinal plants from Kenya	Journal of Trace Elements in Medicine and Biology Volume: 54 Pages: 1-7 Publisher: Urban & Fischer <a href="https://doi.org/10.1016/j.jtemb.2019.03.003">https://doi.org/10.1016/j.jtemb.2019.03.003</a>	1 <sup>st</sup> July 2019

Author	Title	Journal	Date
P.K Tum	Spectral and Sorption Characteristics of Acid Orange II and Methylene Blue Dyes on TiO <sub>2</sub> photocatalyst	International Journal of Science and Technology Volume: 7 Issue:7 Pages: 27-34 DOI No.:10.24940/theijst/2019/v7/i7/ST1907-023	July 2019
CM Gerrard, JM Wanjohi	Factors influencing the implementation of prisons health projects in Kenya: A case of prisons in Meru region	©2019 International Academic Journal of Information Sciences and Project Management (IAJISPM) ISSN 2519-7711 Volume: 3 Issue: 3 Pages: 185-209	5 <sup>th</sup> July 2019
Ruth Anyango Omole, Mainen Julius Moshi, Matthias Heydenreich, Hamisi Masanja Malebo, Jeremiah Waweru Gathirwa, Richard OworOriko, Leonida Kerubo Omosa, Jacob Ogweni Midiwo	Antiplasmodial Biflavonones from the Stem Bark of <i>Garcinia burchananii</i> Engl.	Pharmacognosy Communications Volume: 9 Issue: 3 Pages: 96-99 Publisher: EManuscript Services DOI: 10.5530/pc.2019.3.20.	1 <sup>st</sup> July 2019
Kennedy Olale, Abiy Yenesew, Ramni Jamnadass, Andrew Sila, Keith Shepherd	A simple field based method for rapid wood density estimation for selected tree species in Western Kenya	Elsevier Vol. 5; Pages: e00149 <a href="https://doi.org/10.1016/j.sciaf.2019.e00149">https://doi.org/10.1016/j.sciaf.2019.e00149</a>	27 <sup>th</sup> Aug 2019
Hiram Kirimi, John Wanjohi	Factors Influencing Use of Alternative Dispute Resolution in Construction Projects: Case of Imenti North Sub-County, Meru County	International Academic Journal of Information Sciences and Project Management Volume 3, Issue 4, pp. 572-602	9 <sup>th</sup> Aug 2019
Majau, D.K. & Wanjohi, J.	Factors Influencing Employee Job Performance in County Government Departmental Projects: A Case of Meru County Government, Kenya	International Academic Journal of Information Sciences and Project Management Volume 3, Issue 4, pp. 518-543 518	6 <sup>th</sup> Aug 2019
Mary Njenga, Nancy Karanja, Jacob Kithinji, Ramni Jamnadaa, Miyuki Iiyama, Aya Yonemitsu	Evaluating Fuel Briquette Technologies and their Implications on Greenhouse Gases and Livelihoods in Kenya	World Agroforestry-Research Data Repository <a href="https://doi.org/10.34725/DVN/HTPERS">https://doi.org/10.34725/DVN/HTPERS</a> , World Agroforestry - Research Data Repository, V1	6 <sup>th</sup> Aug 2019

Author	Title	Journal	Date
Daniel Buyinza, Li Jun Yang, Solomon Derese, Albert Ndakala, Paolo Coghi, Matthias Heydenreich, Vincent Kam Wai Wong, Heiko M Möller, Abiy Yenesew	Cytotoxicity of isoflavones from Millettia dura	Natural Product Research Pages: 1-4 Taylor & Francis <a href="https://doi.org/10.1080/14786419.2019.1660335">https://doi.org/10.1080/14786419.2019.1660335</a>	5 <sup>th</sup> Sept 2019
Fozia A Adem, Victor Kuete, Armelle T Mbaveng, Matthias Heydenreich, Andreas Koch, Albert Ndakala, Beatrice Irungu, Abiy Yenesew, Thomas Efferth	Cytotoxic flavonoids from two Lonchocarpus species	Natural Product Research Volume: 33 Issue: 18 Pages: 2609-2617 Publisher: Taylor & Francis <a href="https://doi.org/10.1080/14786419.2018.1462179">https://doi.org/10.1080/14786419.2018.1462179</a>	17 <sup>th</sup> Sept 2019
R Mogwasi, DK Kariuki, ZM Getenga	Effect of Farm Additives on the Potential Bioavailability of Some Nutritional Elements from Kenyan Wild Plants	Biological Trace Element Research Pages: 1-11 Publisher: Springer US <a href="https://doi.org/10.1007/s12011-019-01855-8">https://doi.org/10.1007/s12011-019-01855-8</a>	10 <sup>th</sup> Sept 2019
Harry Amuguni Chanzu, John Mmari Onyari, Paul Mwanza Shiundu	Brewers' spent grain in adsorption of aqueous Congo Red and malachite Green dyes: Batch and continuous flow systems	Journal of Hazardous Materials Volume: 380; Pages: 120897 Publisher: Elsevier <a href="https://doi.org/10.1016/j.jhazmat.2019.120897">https://doi.org/10.1016/j.jhazmat.2019.120897</a>	15 <sup>th</sup> Dec 2019
JM Mwaniki, JO Onyatta, AO Yusuf	Adsorption of Heavy Metal Ions from Aqueous Solutions and Wastewater using Water Hyacinth Powder	International Journal of Trend in Scientific Research and Development (IJTSRD) Volume: 4 Issue:1	Dec 2019
Veronica M Masila, Albert J Ndakala, Robert Byamukama, Jacob O Midiwo, Rahab W Kamau, Mei Wang, Mallika Kumarihamy, Jianping Zhao, Matthias Heydreich, Ilias Muhammad	Synthesis, structural assignments and anti-infective activities of 3-O-benzyl-carvotacetone and 3-hydroxy-2-isopropyl-5-methyl-p-benzoquinone	Natural Product Research Pages:1-9 <a href="https://doi.org/10.1080/14786419.2020.1716346">https://doi.org/10.1080/14786419.2020.1716346</a>	27 <sup>th</sup> Jan 2020
Kiplangat Rop, Damaris Mbui, George N Karuku, Immaculate Michira, Njagi Njomo	Characterization of water hyacinth cellulose-g-poly (ammonium acrylate-co-acrylic acid)/nano-hydroxyapatite polymer hydrogel composite for potential agricultural application	Results in Chemistry Volume: 2 Pages: 100020 Publisher: Elsevier <a href="https://doi.org/10.1016/j.rechem.2019.100020">https://doi.org/10.1016/j.rechem.2019.100020</a>	1 <sup>st</sup> Jan 2020

Author	Title	Journal	Date
Ruth Anyango Omole, Mainen Julius Moshi, Muhammad Ilias, Walker Larry, Hamisi M Malebo, Leonida Kerubo Omosa, Jacob O Midiwo	In vitro Antiplasmodial and Cytotoxic activity of Three Medicinal Plants used Traditionally for Treatment of Malaria.	Pharmacognosy Communications Volume: 10 Issue: 1 DOI:10.5530/pc.2020.1.2	1 <sup>st</sup> Jan 2020
Moses Andima, Paolo Coghi, Li Jun Yang, Vincent Kam Wai Wong, Chrispus Mutuku Ngule, Matthias Heydenreich, Albert Jairo Ndakala, Abiy Yenesew, Solomon Derese	Antiproliferative Activity of Secondary Metabolites from Zanthoxylumzanthoxyloides Lam: In vitro and in silico Studies.	Pharmacognosy Communications Volume: 10 Issue: 1 DOI: 10.5530/pc.2020.1.8	1 <sup>st</sup> Jan 2020
Patrick Kimutai Tum, David K Kariuki	Photocatalytic Degradation of 4-Chlorophenol by Titanium Dioxide: Role of Annealing Temperature and Morphology	International Journal of Innovative Research and Development Volume: 8; Issue: 11 Pages: 235-244	14 <sup>th</sup> Feb 2020
Valerie Bauza, Vincent Madadi, Robinson Ocharo, Thanh H Nguyen, Jeremy S Guest	Enteric pathogens from water, hands, surface, soil, drainage ditch, and stream exposure points in a low- income neighborhood of Nairobi, Kenya	Science of The Total Environment Volume: 709 Pages: 135344 Publisher: Elsevier <a href="https://doi.org/10.1016/j.scitotenv.2019.135344">https://doi.org/10.1016/j.scitotenv.2019.135344</a>	20 <sup>th</sup> March 2020
Richard Oriko Owor, Kibrom Gebreheiwot Bedane, Yolande Ikala Openda, Sebastian Zühlke, Solomon Derese, George Ong'amo, Albert Ndakala, Michael Spiteller	Synergistic anti- inflammatory activities of a new flavone and other flavonoids from Tephrosiahildebrandtiivatke	Journal: Natural Product Research Pages: 1-8 Publisher: Taylor & Fran <a href="https://doi.org/10.1080/14786419.2020.1736065">https://doi.org/10.1080/14786419.2020.1736065</a>	31 <sup>st</sup> March 2020
Richard Oriko Owor, Kibrom Gebreheiwot Bedane, Sebastian Zühlke, Solomon Derese, George Otieno Ong'amo, Albert Ndakala, Michael Spiteller	Anti-inflammatory Flavanones and Flavones from Tephrosialinearais	Source: Journal of Natural Products Publisher: American Chemical Society and American Society of Pharmacognosy <a href="https://doi.org/10.1021/acs.jnatprod.9b00922">https://doi.org/10.1021/acs.jnatprod.9b00922</a>	10 <sup>th</sup> March 2020

Author	Title	Journal	Date
Vaderament-A Nchiozem-Ngnitedem, Leonidah Kerubo Omosa, Solomon Derese, Pierre Tane, Matthias Heydenreich, Michael Spiteller, Ean-JeongSeo, Thomas Efferth	Two new flavonoids from <i>Dracaena usambarensis</i> Engl.	Phytochemistry Letters Volume: 36 Pages:80-85 <a href="https://doi.org/10.1016/j.phytol.2020.01.001">https://doi.org/10.1016/j.phytol.2020.01.001</a>	1 <sup>st</sup> April 2020
Emily B Chebet, Joshua K Kibet, Damaris Mbui	The assessment of water quality in river Molo water basin, Kenya	Applied Water Science Volume:10 Issue:4 Pages:1-10	April 2020
Olivia Osiro, Bernina Kisumbi, David Kariuki, Loice Gathece	Implications of the Minamata Convention on Mercury on Oral Health in Kenya	Kenya Policy Briefs Volume: 1 Issue: 1 Pages: 17-18	26 <sup>th</sup> April 2020
Chrispine M Oloo, John M Onyari, Wycliffe C Wanyonyi, John N Wabomba, Veronica M	Adsorptive removal of hazardous crystal violet dye from aqueous solution using <i>Rhizophoramucronata</i> stem-barks: Equilibrium and kinetics studies	Environmental Chemistry and Ecotoxicology Publisher: Elsevier <a href="https://doi.org/10.1016/j.eneco.2020.05.001">https://doi.org/10.1016/j.eneco.2020.05.001</a>	8 <sup>th</sup> May 2020

## Papers Presented at Conferences

Conference	Theme	Paper Presented	Date
Expert consultative meeting for sustainable global monitoring of POPs under the Stockholm convention	Expert consultative meeting for sustainable global monitoring of POPs under the Stockholm convention	Cytotoxic flavonoids from two <i>Lonchocarpus</i> species by Fozia Ali Adem	12 <sup>th</sup> Feb 2019
Pan Africa Chemistry Network Congress 2019	Riches of the Natural world: sustainable use of Africa's natural products and materials	Cytotoxicity of plumbagin, rapanone and 12 other naturally occurring quinones from Kenyan flora towards human carcinoma cells presented by Prof. Leonidah Omosa Kerubo	5 <sup>th</sup> -7 <sup>th</sup> Nov 2019, Addis Ababa
Pan Africa Chemistry Network Congress 2019	Riches of the Natural world: sustainable use of Africa's natural products and materials	The Kenyan higher plant diversity: a source of anti-parasitic compounds for neglected tropical diseases presented by Prof. Jacob Midiwo	5 <sup>th</sup> -7 <sup>th</sup> Nov 2019, Addis Ababa

Conference	Theme	Paper Presented	Date
Pan Africa Chemistry Network Congress 2019	Riches of the Natural world: sustainable use of Africa's natural products and materials	Red hot compounds from the Red hot poker plant, Kniphofia, and related taxa presented by Prof. Abiy Yenesew	5 <sup>th</sup> -7 <sup>th</sup> Nov 2019, Addis Ababa
Pan Africa Chemistry Network Congress 2019	Riches of the Natural world: sustainable use of Africa's natural products and materials	Anti-vancomycin-resistant Enterococcus faecum and E.Faecalis activities of (-)-Gossypol and Derivative from Thespeciagarckeana	5 <sup>th</sup> -7 <sup>th</sup> Nov 2019, Addis Ababa
Pan Africa Chemistry Network Congress 2019	Riches of the Natural world: sustainable use of Africa's natural products and materials	Rotenoids from East African Plants-Structure, Stereochemistry and Biological Activity	5 <sup>th</sup> -7 <sup>th</sup> Nov 2019, Addis Ababa
Royal Society of Chemistry	14 <sup>th</sup> International Conference on Materials Chemistry (MC14)	Ruthenium (II) Oxathia Crown Ether Complexes: synthesis, Characterization and their Application in the Detection of Mercury (II) Ions'	8 <sup>th</sup> -11 <sup>th</sup> July 2019

## Consultancies/Research Projects

Funder	Project	PI/Project Leader	Amount (currency)	Duration	Comments
Bill gates	Zeolite hydrogel nano-mop for contraception	Dr. Benson Wamalwa	US Dollars 100,000	01/05/2010 to 30/11/2021	Active
Grand Challenges Canada	Saving lives at birth a loyally program		USD 331383	01/01/2016 to 31/12/2018	Active
Grand Challenge Canada	Bar codes for improved child vaccination and famine nutrition		USD 113000	23/03/2012 to 01/04/2014	Active
IDRI	Infectious diseases research	Prof. Jacob Midiwo		10/05/2011	Active
Uppsala University	Ken02 chemistry		Sek 2,881,975	01/01/2011 to 31/12/2017	
National Research Fund (NRF)	Xploring Kenya Biodiversity Chemistry, Phamacology and Commercialization		Euro 44,000	01/04/17 to 31/05/2018	Active

Funder	Project	PI/Project Leader	Amount (currency)	Duration	Comments
GEF-NPIF (Kenya Wildlife Service)	Developing the microbial biotechnology industry from soda lakes in Kenya	Prof. L. Kerubo	USD 440,000	31/08/2017	Active
ICIPE	Promoting small holder access to fungal bio pesticides through public private partnership in East Africa		USD 54,758	01/03/2018 to 30/12/2021	Active
The Welcome Trust	Cement dust exposure and related effects in Kenya	Dr. Faridah Were	KES400,000	13/10/2017	Active
Uppsala University	Capacity building for PhD students	Prof. Lydia Njenga	SEK 101,760	9/02/2016 to 31/05/2016	Active

## Staff Portfolio

Designation	No. of Staff
Professor	4
Associate Professor	8
Senior Lecturers	9
Lecturers	15
Tutorial Fellows	3
Principal Technologist	1
Chief Technologist	1
Assistant Chief Technologist	2
Senior Technologist DEF	8
Technologist ABC	9
Technical Assistant II	1
Document list	1
Senior Administrative Assistant	1
Secretary	1
<b>Total</b>	<b>41</b>

## Active Grants

Title	Amount (Ksh)	Coordinator
To Establish NMR Centre of Excellence	42,796,236	Prof. John Onyari
Strategic Partnership For Higher Education	2,669,437,652	Prof. John Onyari
Promoting Smallholder Access to Fungal Biopesticides	120,000	Prof. Leonida Kerubo
PAN African Chemistry Network	509,986,500	Prof. J. Midiwo
Kenya GMP2 POPS Project	1,645,045,490	

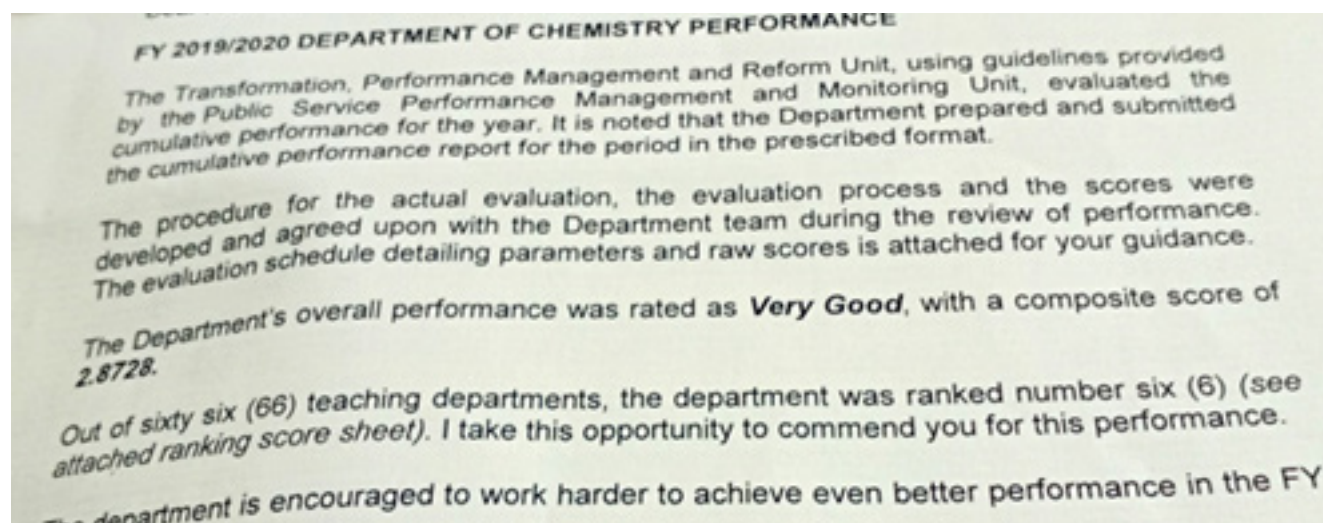
## Programmes Engaging Guest Lecturers/Speakers

Guest Lecturer/ Speakers	Programme	Details	Date
Dr. Wanyonyi, Wycliffe	Project Management	Part-Time lecturer	11 <sup>th</sup> January 2019
Prof. H.C. Michael	Chemical Interactions of Plant-microbes	Chemical Interactions of Plant- microbes	1 <sup>st</sup> April 2019
Dr. Cecil Kingondu	Seminar	Specific Capacitance-pore Texture Relationship of Biogas Slurry Mesoporus Carbon/MnO <sub>2</sub> composite Electrodes for supercapacitors.	10 <sup>th</sup> April 2019
Dr. Agnieszka Wegrzyn	Synthesis, characterization and application of new materials obtained from natural and synthetic layered minerals in environmentally friendly adsorption and catalytic processes	Synthesis, characterization and application of new materials obtained from natural and synthetic layered minerals in environmentally friendly adsorption and catalytic processes presented by Dr, Agnieszka Wegrzyn, Jagiellonian University in Krakow, Faculty of Chemistry	3 <sup>rd</sup> July 2019
Prof. Fulgentius Nelson Lugemwa	Organic Chemistry	Visiting Professor from Pennsylvania State University-York, US	1 <sup>st</sup> Sep 2019

## Achievements

### Performance Contract

The Performance contract between the School of Physical Sciences Management Board and Department of Chemistry for the period 1st July 2020 and 30th June 2021 was signed on 1st July 2021. The Performance matrix was circulated to all staff. It will be measured by its success in meeting or surpassing the performance targets set out in the Performance matrix.



### Sub-Regional Lead Poisoning Prevention Week

The Department hosted a Sub-Regional Lead Poisoning Prevention Week of action campaigns to ban import, export and use of lead paint across the East Africa region. It was held Online on 29<sup>th</sup> October 2020.



The aim of International Lead Poisoning Prevention Week is to draw attention to the health impacts of lead exposure, highlight efforts by countries and partners to prevent childhood lead exposure, and accelerate efforts to phase out the use of lead in paint.

The sub-regional Event sponsors are University of Nairobi, Basco Paints, Dura Coat and the partners in this campaign includes; KEBS, The Architectural Association of Kenya, UNEP, KIRDI, NEMA, Ministry of Environment & Forestry, Ministry Health, World Health Organization and many other Partners.

## Distribution of Hand Washing Soap

UON-BASF Chiroklean Liquid Soap hand wash distribution to the University of Nairobi community.



*The University of Nairobi, Department of Chemistry in collaboration with BASF Company distributed Chiroklean Hand wash to the University of Nairobi community. The event was graced with the presence of the UoN Vice Chancellor, Prof. Stephen Kiama.*

## Chemistry Staff Team Building



*Corporate Social Responsibility/ Outreach Services*

1. Faridah Hussein Were: Chairlady, Technical Committee for the East Africa Standard for Paints and Allied Products & Member of Advisory Council of Lead Alliance Partner.
2. Prof. D.K Kariuki, External Examiner, University of Zambia & University of Malawi, Harzadious & Toxic Matyerials Committee member, NEMA, Threshold Pollution in Waste Water Committee, WARMA.
3. Dr. Wanjohi John: External Examiner; Kenyatta University.
4. Dr. Derese, Solomon: External Examiner; Masinde Muliro & Karatina University.

## Other Activities

### Conference/Workshop/Symposium

The Department organized the following events;

- i) Revised chemistry undergraduate programs: Bachelor Of Science Chemistry, Bachelor of Industrial Chemistry and Bachelor of Analytical Chemistry.
- ii) Launch of Uon-Basf Chiroklean Liquid Soap Hand Wash

## Challenges

- i) Delay in completion of thesis by postgraduate students.
- ii) Procurement process (EPMIS) – delay in procuring and delivery of lab materials.
- ii) Virtual teaching challenges against face to face

## Institute for Climate Change and Adaptation



*ICCA Students fieldwork in Kilifi County*

### A Brief Historical Background of ICCA

The Institute for Climate Change and Adaptation traces its beginnings to December 2010 when a team of researchers from the University of Nairobi and Maseno University sought and received funding from the Open Society Institute to establish the Climate Change Adaptation Research Institute (CARI) at the University of Nairobi. The name was subsequently changed to what it is at present: Institute for Climate Change and Adaptation, or simply: ICCA, at the University of Nairobi.

The ICCA is unique in both its pedagogical approach and in its choice of concentration areas. Its institutional programmes are envisaged to:

1. Build the human capacity needed to address climate change and adaptation that meet African societies unique needs, by offering University-based curricula for conventional degrees and short training courses for a wide range of professionals from all sectors of society;
2. Encourage action-oriented research activities, including research into climate change adaptation technologies, that will help improve the climate adaptation capacity of Africa as a continent;
3. Provide a framework for national and regional policy assessments and advice to governments and other public and private sector actors, and include the grassroots and various communities within the African region in its programme execution and implementation of research findings.

### Objectives of the ICCA

ICCA's programme objectives are summarised to include the following:

1. Provide formal training on Climate Change and Adaptation at postgraduate level (Masters and PhD levels initially), and later at the undergraduate level;
2. Conduct professional Short courses for various climate change and adaptation actors and stakeholders in the public and private sectors including for Non-Governmental Organisations (NGOs);
3. Undertake Climate Change and Adaptation research and participate in knowledge exchange with other global Climate Change actors and institutions;

4. Undertake action-oriented community outreach programmes for implementation of practical climate change and adaptation options; and
5. Provide research and evidence-based policy advice on Climate Change and Adaptation to governments and public sector institutions in Kenya and Africa.

## Thematic Areas

The Institute pursues its programmes on the basis of the following five thematic areas:

1. Water, Environment and Ecosystems
2. Climate Risk Management and Food Security
3. Human Dimensions and Health
4. Policy and Communications
5. Technologies

## Programmes Offered

1. Master of Climate Change and Adaptation (MCCA)
2. PhD in Climate Change and Adaptation

## Research and Community Projects

1. REACH Project - PI, Professor Daniel Olago.
2. BRECCIA Project - PI, Dr. Gilbert Ouma (<http://www.gcrf-breccia.com/>).
3. Development Corridors Partnership - PI, Professor Daniel Olago.
4. African Great Lakes Information Platform (AGLI) Project - PI, Professor Daniel Olago
5. TSITICA (ARUA) Project - Co-PI, Dr. George Outa.
6. Science and Policy Interface Programme: Dan Olago and George Outa

## Institutional Achievements

ICCA is meeting its core mission, supported by strong academic programs and founding academic staff who are committed to its mission of aiming to further improvements in organizational performance and student success.

The strongly embedded 'Trans-disciplinary Approach' to learning and education has ensured adoption and acceptability by students, researchers and community stakeholders. Students from many parts of the world have not only enrolled at ICCA but are accessing world-class education through the early embrace of the to the ICT platforms by ICCA staff to counter the challenges that are being experienced due to COVID 19

ICCA maintains a strong and rigorous academic culture that provides students with knowledge, skills, and competencies needed to further their career way beyond the academia. Our graduates are able to find employment in the National Government, County Governments, teaching and research institutions, Non-Governmental Organisations, business and in self-employment. Since inception a total of 143 Masters and 186 PhD students have enrolled a reflection of the popularity of the programs.

Our Sustainability Initiatives encompass economic, environmental and social equity principles, and a myriad of activities, projects and practices across the campus and in the community. Through this holistic approach ICCA has made sustainability a focused effort of its training;

ICCA is contributing immensely to the revenue kitty of the University of Nairobi in both fees and research grants. In 2020/2021 academic year, the Institute was able to raise Kshs 6,732,000 in fees and 36,000,000 in research grants. Since inception, the institute has attracted more than Kshs 100 million in terms of research grants.

## Student Enrolment 2020-2021

The Institute attracted 17 Masters and 15 PhD students.

## Staff Portfolio

The ICCA was established with the positions of a Director, three Co-coordinators and Administrative Staff.

The ICCA has an academic staff establishment of six comprising Professor, Associate Professor, Senior Lecturer, Lecturer and two Tutorial Fellows.

Designation	No. of Positions
Director	1
Coordinators	5
Associates	5
Tutorial Fellows	2

## Strategic Issues

Teaching and learning, the primary objective of the University is teaching and learning. So is also the first objective of the Institute. The Institute builds competently trained and enabled postgraduate students who are capable of competing at an international level. Above all, the graduates would be trained to work in any environment of the society; they will be society leaders in moulding and shaping a future where human activities have threatened the planet. A future that is experiencing resources quickly depleted through unsustainable lifestyles.

## Any Other Pertinent Issues

In 2020, the Institute bid farewell to the founding Director, Prof. Shem Wandiga, a commensurate academic and a pioneer in the nexus between environmental studies and chemistry. The Institute is now in the capable hands of Prof Daniel Olago, a leading researcher in the field of Earth Sciences. We wish Prof. Wandiga the best in his future endeavours.