

UNIVERSITY OF NAIROBI
SCHOOL OF ENGINEERING
DEPARTMENT OF ENVIRONMENTAL AND BIOSYSTEMS ENGINEERING
ANNUAL REPORT 2011-2012

1. Introduction.

The Department of Environmental and Biosystems Engineering programme prepares its graduates for careers requiring application of physical, biological, and engineering sciences to problems that involve environment and living systems. The scope of Environmental and Biosystems Engineering is broader and encompasses agriculture, the environment, food, forestry, aquaculture and bio-based production and processing systems in industries and rural development.

Our Curriculum is student centered and balances theory and practice. Unlike the traditional engineering courses that provide linear intervention, our curriculum prepares our graduates to provide evolving solutions in a closed loop and thus continual improvement and sustainability.

2. Courses offered.

The Department offers B.Sc., MSc. and PhD in Environmental and Biosystems Engineering

3. Enrollment of undergraduates and postgraduates

UNDERGRADUATES				
NO	LEVEL OF STUDY	MALE	FEMALE	TOTAL
1.	First Year	37	18	55
2.	Second Year*	36*	10	46
3.	Third Year	41	17	58
4.	Fourth Year	36	10	46
5.	Fifth Year	29	7	36
TOTAL		179	62	241

*One International student (Male)

POSTGRADUATES (MSc.)				
NO	LEVEL OF STUDY	MALE	FEMALE	TOTAL
1.	Part I *	11*	1	12
2.	Part II	43	7	50
TOTAL		54	8	62

*One International student (Male)

POSTGRADUATES (PhD)				
NO	LEVEL OF STUDY	MALE	FEMALE	TOTAL
1.	First Year	7	-	7
TOTAL		7	-	7

4. Research Interests

- Agricultural /Aquatic Machinery
- Agricultural Process /Food Engineering
- Concrete and Fibre Reinforced Concrete
- Conservation Agriculture
- Egg Incubation
- Environmental Control and Simulation
- Environmental Impact Assessment and Environmental Audit
- GIS and GPS Mapping
- Granular mechanics
- Industrial Safety
- Land Husbandry and Landscape Engineering
- Landscape and Biomass mapping using remote sensing and GIS
- Occupational Health and Safety
- Produce Drying
- Rain Water Harvesting
- Reinforced Concrete
- Renewable Energy
- Rural Power, Transport and Access
- Soil and Water Engineering
- Soil Tillage and Fertility Management
- Timber and, Animal Housing
- Waste water management
- Water Resources Engineering
- Water Systems Engineering

5. Research activities

TITLE OF RESEARCH PROJECT	YEAR	RESEARCHERS
· Water harvesting, Environment, Health and nutritional sustainability I Kitui west (NCST). (In progress)	2012	A.N. Gitau
· Post-harvest control of aflatoxin contamination in stored maize using super absorbent polymers (STTPs) in improved and affordable design of storage structures. (funds from NCST) (In progress)	2012	Dr. D. O. Mbuge
· A Three Dimensional Environmental Simulation Model of a Greenhouse System	2012	J. O. Agullo

6. International Links and Collaborations:

- Department of Environmental Health, safety and Emergency management (EHSEM) -Harvard University & Department of Environmental and Biosystems Engineering -UoN
- Africa Biofuel and Emission Reduction (East Africa) Ltd. & Department of Environmental and Biosystems Engineering -UoN
- Department of Environmental and Biosystems Engineering -University of Nairobi/EURA Innovation GmbH (2012)
- Food and soft laboratory, ETH Zurich, Department of health science SWITZERLAND, and University of Nairobi(ICIPE) (2011 to date)
- Biofuel Africa & Department of Environmental and Biosystems Engineering -UoN The Department also has a consultancy unit. (2011 to date)
- Department of Environmental and Biosystems Engineering -University of Nairobi / University of Siegen - Germany
- Department of Environmental and Biosystems Engineering -University of Nairobi / EurA Innovation GmbH
- Department of Environmental and Biosystems Engineering -University of Nairobi / Department of Agri-Food Science and Technology - University Of Bologna (EDULINK II) on Energy-agro food synergies in Africa: New Educational Models for Universities.

7. Publications (Books/Journals)

TITLE	YEAR	AUTHOR
• Optimizing the Performance of a Manually Operated Groundnut (Arachis hypogaea) Decorticator	2012	A.N. Gitau
• Mechanical properties of groundnuts- Maxwell publishers	2012	V. K. Too, E.B. K. Mutai, J. M. Mutua, D. A. Mutuli, D. O Mbuge
• Use of UASB reactor in treatment of Dairy industry waste water in New KCC Kitale factory - IJE (ISSN-0974-407X)	2012	P.K Kimani, B. N.K. Njoroge, A.N. Gitau Volume 5 May 2012
• Viscoelastic Properties of Bulk Groundnuts	2012	K.V. Too, E.B.K. Mutai, J.M. Mutua, D.A. Mutuli and D.O. Mbuge
• Revision of Farm structures Text book Completed (Funded by FAO)	2012	L. O. Gumbe & J. Agullo.
• State of the Art Report on Global and Regional Soil Information: Where are we? Where to go? FAO, Rome http://www.fao.org/docrep/017/i3152e/i3152e.pdf	2012	Omuto CT, Nachtergaele FO, Vargas-Rojas R. 2012

8. Staff and their designation

DESIGNATION	NO
Professor	-
Associate Professor	2
Senior Lecturer	6
Lecturer	4
Assistant Lecturer	2
Part Time Lecturer	8
Chief technologist	2
Senior Technologist	-
Technologist	4
Technical Assistant Grade IV	3
Secretary	3
Driver	1
Subordinate staff	2

9. Number of granduands (diploma, bachelors, postgraduate diploma, masters, and PhD

UNDERGRADUATES				
NO	LEVEL OF STUDY	MALE	FEMALE	TOTAL
1.	Bachelors	26	4	30
2.	Masters	-	1	1
3.	PhD	1	-	1
TOTAL		27	5	32

10. Number of papers presented in conferences

- *Illustration of the process involved in data preparation for a watershed hydrologic model -J. P. O. Obiero*, M. A. Hassan* and J. Sang. At the Department of Biomechanical and Environmental Engineering, Jomo Kenyatta University of Agriculture and Technology.*
- *Eng. Gichuki Muchiri delivered a talk on "The Role of Mechanization in Agriculture" at Jomo Kenyatta University of Agriculture and Technology (JKUAT) on Friday 24th February, 2012 from 9.30. am to 1100.am.*

11. Corporate social responsibility activities

- *Environmental and Biosystems Engineering Students open day held on 21st April 2012 at upper Kabete Campus.*
- *Represented the School of Engineering at the Annual Tree Planting Event at the University Farm Kanyariri on 2nd November 2012*
- *Ploughing contests for seedbed preparation for improved agricultural production through the Kenya Ploughing Organization (KPO) e.g. participated at the National Ploughing contest on 5th Nov 2012 at UoN Farm Kanyariri*
- *Environmental And Biosystems Engineering Students Association EBESA visited Nairobi Children's Home On 8th December 2012*

12. Other activities

- *Dr. A. N. Gitau participated in evaluation of consultants for GEF SGP Baseline Assessment in Laikipia County.*
- *Mr. Januarius Ondiek Agullo- recruited by Training Centre in Communication (TCC) to train participants on the use of R statistical package for data analysis. (12th -16th March 2012)*
- *J. P. Obiero Invited to participate as a consultant (Resource person) in the training of international students in a 6 month postgraduate diploma course on integrated water resources management at Egerton University, An initiative between Egerton University and ITC Netherlands. I was resource person to handle module on GIS-based catchment modeling-12-16th March 2012*
- *J. P. Obiero Convened an annual general meeting (AGM) for the Nairobi Branch of the Kenya Ploughing Organization, a subcommittee of the Agricultural Society of Kenya (ASK) on 9th January 2012 To review 2011 activities, and plan for the 2012 activities that include ploughing competitions, etc. He is the current Chairman of KPO (Nairobi Branch).*
- *J. P. Obiero participated at the AGM for the National office of the Kenya Ploughing Organization (KPO) on 23rd March 2012 at the Show Ground, Nairobi.*
- *J. P. Obiero Participated at the executive committee meeting of the ASK held on 16th February 2012 to discuss planned construction projects proposed for the show ground that include wall fence, rehabilitation of water infrastructure etc.*
- *Training on seed drying, processing and storage for professionals working in seed production in Sub- Saharan Africa in collaboration with the Faculty of Agriculture - Dr. A. N. Gitau, Dr. D. O. Mbuge, Eng. J. M. Mutua, E. M. Mwachoni, R. M. Mathenge - May 2012 (photos attached)*
- *Environmental and Biosystems Engineering 5th year Students dinner held on 31st May 2012 at Kabete Vet golf Club. (photos attached)*
- *IEK exhibition at KICC on May 11, 2012 - E. B. K. Mutai (photos attached)*
- *J. P. O. Obiero Organized Nairobi Branch Ploughing contest coordinated by the Agricultural Society of Kenya (ASK-Nairobi branch) in which the department was a participant.*
- *J. P. O. Obiero Participated in the planning of the 2012 Nairobi International Trade Fair (NITF) as an executive committee member.(27th October 2012)*
- *Prof. G. R. A MCHAU Dean, School of Agriculture from the University of Venda (South Africa) visited SoE and the department on a Benchmarking tour.*
- *Visitors from Reckoning International visited our department on 31st July 2012 for possible cooperation on the use of conservation tillage equipment.*
- *Keller Joegen from University of Siegen - Germany visited our department on 18th Dec 2012 seeking possible cooperation.*



Visitors from Reckoning International (Daniel and James) in a discussion Chweya, Wamutitu & Mathenge during their tour to our workshops on 31st July 2012



EBE students on a visit to African Diatomite Company Kariandusi on 20th July 2012



EBE staff during the annual tree planting on 5th Nov 2012 at UoN Farm.



EBE Students during the annual tree planting on 5th Nov 2012 at UoN Farm.



Students playing chess, draft and scrabble



Students playing chess, draft and scrabble





EBESA ON A TOUR TO NAIROBI CHILDRENS HOME ON 8TH DECEMBER 2012



Having fun with the children