DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

2016

Graduation Magazine



Better Life Through Technology

DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY (DeKUT)
Better Life through Technology

THE SECOND DeKUT INTERNATIONAL CONFERENCE ON SCIENCE, TECHNOLOGY, INNOVATION AND ENTREPRENEURSHIP

DATES: 2nd – 4th November 2016 VENUE: DeKUT Main Campus, Nyeri, Kenya

ANNOUNCEMENT AND CALL FOR PAPERS

CONFERENCE THEME: **Sustaining Development through Science, Technology, Innovation and Entrepreneurship**

Preamble

In order to fulfill its role of enhancing science, technology, innovation and entrepreneurship to stimulate economic growth, as well as meeting the aspirations of the Kenya Vision 2030 of transforming Kenya into a globally competitive, newly industrialized, middle-income country, DeKUT is organizing the Second International Conference on Science, Technology, Innovation and Entrepreneurship that is expected to draw participation from around the globe.

The objectives of the conference are to:

(i) Provide a forum for research peers from local and international institutions to discuss, share and publish research information.
(ii) Provide a forum that will allow improvement of the University's approach to National sustainable development oriented scientific research as it strives to remain a premier technological university.
(iii) Provide an opportunity for the industry to interact with researchers and innovators through exhibitions.
(iv) Provide a forum through which the University staff will disseminate their research findings and showcase their innovations to the society.
(v) Provide a forum that will allow research students from different countries to interact with each other

Conference Sub Themes

1. Engineering Technologies and Innovations for Industrialization.
2. Business Management and Entrepreneurship for Sustainable Development.
3. Basic and Applied Sciences for Advancement of Research and Innovations.
4. Innovative Agricultural Sciences and Technologies for Sustainable Food Production and Food Security.
5. Water, Energy, GIS and Remote Sensing, Environment, and Climate Change.
6. Health Sciences and Community development.
7. Information and Communication Technology for Development.
8. Tourism, Wildlife and Hospitality Management.
9. Policy, Governance, Cultural and Socio-Economic Aspects for Competitive Advantage.
10. Security Trends and Innovations.
11. Trends in Technical Education and Training.

Guidelines to Authors

Application for participation in the conference can be made by completing the provided registration form. Abstracts can be prepared using the abstract template provided. Electronic copies of the registration form and abstracts should be submitted to the conference secretariat via e-mail: ***sti.conference@dkut.ac.ke***

The deadline for submission of abstracts is **6th May, 2016**. The abstract should outline the aims, methodology, results, discussion and conclusions. It should include the title, the name(s) of the author(s), affiliation, mailing address, e-mail address and telephone contacts. Authors should also state the sub-theme and indicate their preference for oral or poster presentation. The deadline for acceptance of full papers will be **12th August, 2016**. Authors must follow the Guidelines for the Full Paper Submission provided.

Selected papers will be published in the Journal of Applied Sciences, Engineering and Technology for Development.

Exhibitions

There will be facilities and space at the conference venue for organizations and individuals to exhibit products and disseminate information relevant to the conference theme.

Accommodation

Hotel accommodation is available in Nyeri Town at a price range of KES 3,000 -12,000 (US$ 30-120) per person half board. Booking can be facilitated through the conference secretariat on prior request.

Important Dates

Deadline for Abstract Submission	6th May, 2016
Notification of Abstract Acceptance	3rd June, 2016
Early Bird Registration	By 29th July, 2016
Normal Registration	By 14th October, 2016
Late Registration	After 14th October, 2016
Deadline for Submission of Full Papers with Revised Abstracts	12th August, 2016
Deadline for Exhibition Registration	14th October. 2016
Conference Dates	2-4 November. 2016

Conference Registration Fees

PARTICIPANTS	EARLY REGISTRATION (By 29th July, 2016)	NORMAL REGISTRATION (By 14th Oct, 2016)	LATE REGISTRATION (After 14th Oct, 2016
East Africa Community	KES 8,000 US$ 80	KES 10,000 US$ 100	KES 11,000 US$ 110
Other regions	KES 10,000 US$ 100	KES 12,000 US$ 120	KES 13,000 US$ 130
Students	KES 2,000 US$ 20	KES 2,500 US$ 25	KES 3,000 KES 30
Exhibitors	KES 20,000 US$ 200	KES 20,000 US$ 200	KES 20,000 US$ 200

Payments should be made through cheque, electronic funds transfer or direct cash deposit to:
Dedan Kimathi University of Technology
Account number 10061200000062
Consolidated Bank, Nyeri Branch, Kenya
Bank code: 23, Branch code: 007
Swift code: CONKKENAXXX

Please retain original receipt or transfer notification for our records during the conference. Conference fees will cover refreshments, lunch and conference materials only.

ENQUIRIES

For further information and clarifications kindly contact:
The Conference Secretariat,
Dedan Kimathi University of Technology,
P.O Box 657-10100, Nyeri, Kenya
Telephone: (+254) 061 2050000, (+254) 0706 680670, (+254) 0719 311223
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Or visit www.dkut.ac.ke

Contributors: Content for this publication has been developed by University Staff and designed and printed by Design Options

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Dedan Kimathi University of Technology 4th Publication April 2016 (Put copyright icon)

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Vice Chancellor's **Message**



Welcome to the Fourth Graduation Ceremony Magazine. This is a joyous occasion to all the University's stakeholders and most especially the 2016 graduands as we mark yet another milestone in the University's development. We will confer and award over 1400 degrees, diploma, and certificates, and hence make a significant contribution of well trained human resource to the Kenya, an assurance that we are contributing to National and Global Development. The number of those graduating with postgraduate degrees is growing in the great all realization of the University's research mandate.

The University has experienced growth on many fronts during this academic year. Notable among them are: the accreditation of programmes; introduction of new programmes, new collaborations, and strengthening community linkages, and higher ranking in many ranking platforms. Our Engineering programmes- Bachelor of Science in Mechanical Engineering, Bachelor of Science in Mechatronic Engineering, Bachelor of Science in Civil Engineering and Bachelor of Science in Electronics and Electrical Engineering- were accredited by the Engineering Board of Kenya (EBK) and Bachelor of Science in Criminology and Security Management was accredited by the Commission for University Education (CUE).

The University also successfully launched the PhD in Mechanical engineering with over 10 candidates in one cohort, the very first time there has been such high response in this field in Kenya. The University won European Union (EU) grants for PhD and M.Sc. programmes jointly with University of Leuven. Another EU funded project on Coffee Productivity Project (CPP) and the Coffee Research Institute (CRI), as a contracting authority, has been virtually concluded and is now serving its objective of producing high quality coffee seedlings and ensuring their availability to the community at a subsidized price, providing seedlings that are disease resistant and not susceptible to diseases like Coffee Leaf Rust and Coffee Berry Disease and offering a facility where farmers and local community can be trained on good production practices in coffee.

The University also established Collaboration agreements with the Korean Police University which will immensely enhance the B.Sc. degree programme in Criminology and Security management. These are great additions to other existing and active collaborations with local and International companies.

This academic year, the staff and students continued the team spirit fostered last year by participating in the second edition of "Climb to Educate" by climbing Mt. Kenya. A total of 200 staff and students made it to the top this year. This is one of the activities that raise awareness towards the Endowment Fund. The University further took a step in partnership with The Nyeri Golf Club, the DeKUT Alumni Association to establish an Annual Charity Golf Tournament towards the Endowment Fund. The first tournament took place on 20th February, 2016. These and much more are all indications that the University is moving in the spirit of her vision.

On behalf of the University Management Board, the Senate and Staff, I take this opportunity to congratulate all the graduands and all who made this day a reality through their support. I also acknowledge the leadership, guidance and support of the University Council and the government, through the Ministry of Higher Education Science and Technology.

Prof. Eng. P. Ndirangu Kioni
Vice Chancellor

Leveraging on Industrial Collaboration and International Linkages in Postgraduate Engineering Programmes

By Prof. Peter N. Muchiri



The DeKUT's School of Engineering offers premier post graduate engineering degree programs which supports National development goals in areas of Energy engineering, design, manufacturing and industrialization, in line with vision 2030 of Kenya's development blue print. Among the post graduate degrees programs offered are; Masters in Industrial engineering, Masters in Advanced Manufacturing and Automation Engineering, Masters in Mechanical engineering, Masters in Geothermal Energy Technology and PhD in Mechanical Engineering (with specializations in Precision Manufacturing & Automation Engineering, Industrial Engineering, Combustion & Pollution Control, Material Engineering, and Sustainable Energy Systems Engineering).

While training in Postgraduate engineering programs demands solid theory and experimental work, the solving of real industrial problems provides the real litmus test of the quality of the engineering graduates. DeKUT has adopted the strategy of industrial linkage and collaboration as a key way of ensuring exposure of students to the industry and also ensuring the students are able to solve industrial problems during their research work. This strategy acts like a two edged sword: It enhances the training of engineering students through industrial exposure while still providing valuable solutions to the companies collaborating in the research. This is a win-win situation for both the company and the University.

Moreover, DeKUT is collaborating with international Universities in the training, research and staff and students exchange to enhance the quality of its programmes. For example, through the collaboration with Technical University of Applied Science (TUAS)-Wildau in Germany, two Masters students in Advanced Manufacturing and Automation engineering and one PhD student in Mechanical engineering from DeKUT conducted their research in Germany for a period of 3 months late last year, under the supervision of German Professors. In the same year, 2 German Professors from TUAS visited DeKUT and taught our postgraduate engineering students. Further, our Engineering staff members lead by Prof. Eng. Paul Wambua, Prof. Peter Muchiri and Dr. Jean Bosco visited Germany in the





Prof. Peter Muchiri and Dr. Jean Bosco giving lectures in Technical University of Applied Sciences (TUAS) - Wildau in Berlin, Germany during the staff exchange program of DeKUT with TUAS, Germany

staff exchange program and explored the Engineering training in TUAS. Further, the DeKUT staff members gave public lectures to German students. These ongoing collaborations and linkages will go a long way in enhancing quality in our Engineering training.

To create value in our post graduate programs, the thesis work is directed more towards applied technology in the industry. The research focuses on real problems in the industry/practice and must provide feasible/practical solutions to the problems, by use of the acquired theoretical knowledge. This is being achieved by advancing strong collaborations between the University and the Industry for research on real problems in practice and provision of feasible solutions to the industry. Currently, around 50 research theses are being conducted in the industries in Kenya, which is a good achievement for a University of Technology. The companies involved in these researches are from diverse fields like energy generation, automotive assembly, manufacturing, sugar industry, cement industry, food processing among others.

Among the companies collaborating with DeKUT in Post graduate research are; Kenya Energy Generating Company (KenGen), where 12 research projects are currently being undertaken by our Masters students in Geothermal Energy



Prof. Peter Muchiri and Dr. Jean Bosco giving lectures in Technical University of Applied Sciences (TUAS) -Wildau in Berlin, Germany during the staff exchange program of DeKUT with TUAS, Germany

Technology and Masters in Industrial Engineering. In Geothermal Development Company (GDC), 8 research projects are being undertaken by our MSc. Students in Geothermal Energy Technology. In Numerical Machining Complex (NMC), 3 research projects are on-going in areas of steel processing and manufacturing by M. Sc. in Industrial Engineering students and M. Sc. in Advanced Manufacturing and Automation Engineering. In East African Portland Company, 4 research topics have been conducted by M. Sc Industrial Engineering students. The other companies that have opened doors for industrial research are General Motors, IBER Africa, Sony Sugar, Mumias Sugar, Kenya Bureau of Standards (KeBS), Kenya Industrial Research Institute (KIRDI), Coca cola among others.

Among the completed industrial research has produced key highlights to the industries involved. For example in a leading motor vehicle assembling company in Kenya, a Masters in Industrial Engineering research focused on productivity improvement of the assembly line by use of modeling and simulation of the plant. Key process bottlenecks were identified and appropriate improvement strategies employed. The research helped to reduce the vehicles production cycle time and increased production throughput from 18 units per day to 30 units per day! This will have long lasting impact on company's productivity, profitability and competitiveness and demonstrates the benefit of industrial collaboration to the industries.

In the coming years, DeKUT envisions research collaboration in more than 80% of the industries in Kenya. This will enhance production of engineering graduates with practical problem solving skills, which will make an instant contribution in the industry and contribute to national development.



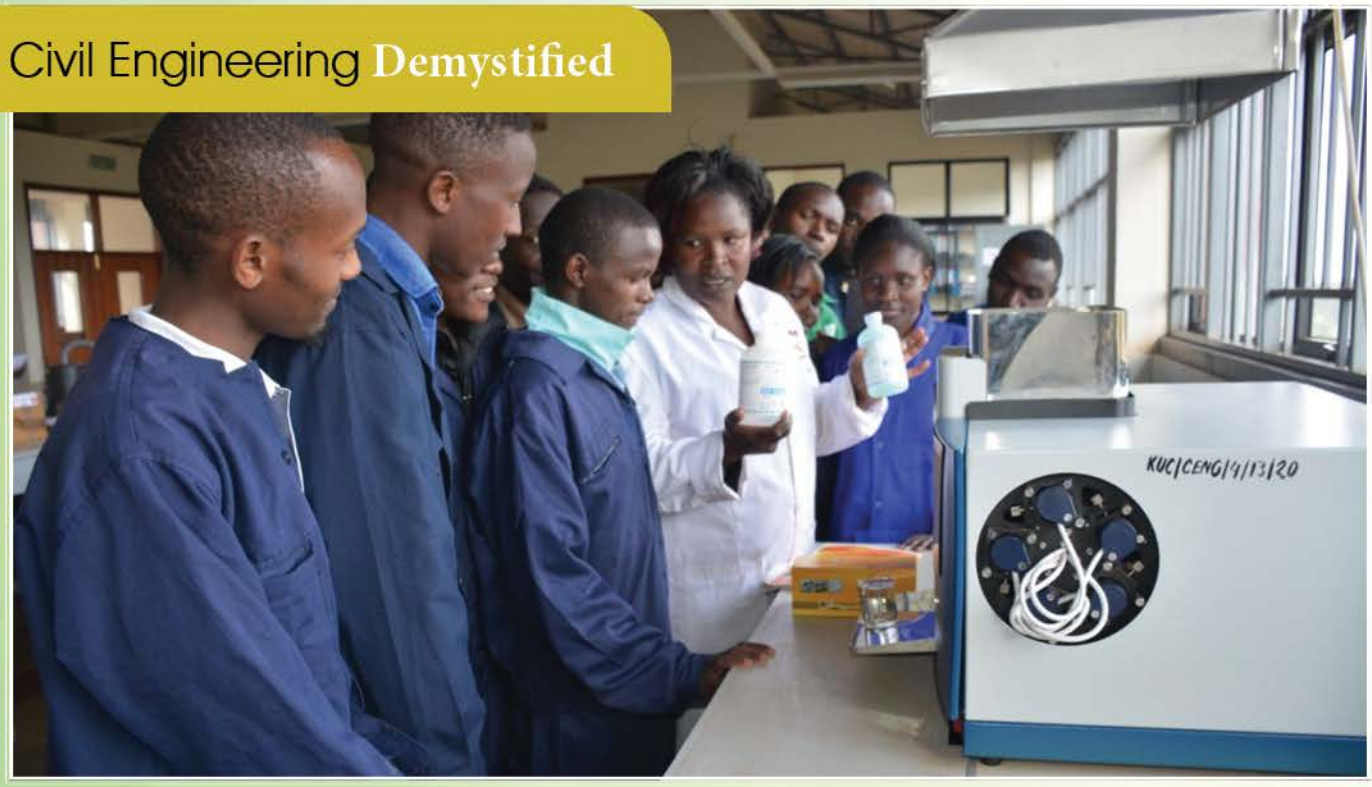
"My name is James Njoroge. I am a Production Manager at a leading vehicle assembler in Kenya. I applied the theory from the M. Sc Industrial Engineering course in my plant and achieved productivity improvement from 18 units per day to 30 units per day



"Prof. Peter N. Muchiri has a PhD in Mechanical Engineering from University of Leuven, Belgium. He is currently the program coordinator of Masters in Industrial Engineering programme and the Director of Nairobi Campus of Dedan Kimathi University of Technology". You can contact him through: peter.muchiri@dkut.ac.ke

"DeKUT is collaborating with international Universities in the training, research and staff and students exchange to enhance the quality programmes."

Civil Engineering **Demystified**



Laboratory Training on the Atomic Absorption Spectrophotometer

Civil Engineering is an engineering discipline that is concerned with the design, construction, and maintenance of the physical and built environment. The built environment encompasses most of what defines modern civilization including buildings, bridges, roads, railroads, airports, canals, water treatment and supply systems, wastewater treatment and conveyance systems, etc. Due to the diverse nature of the Civil Engineering profession, it is broken down into several thematic areas including structural engineering, transportation engineering, water engineering, environmental engineering and geotechnical engineering, among others.

The Bachelor of Science in Civil Engineering course offered at Dedan Kimathi University of Technology is a five year program designed to equip students with the requisite theoretical and practical skills for national development. The course has been offered since 2009 and this year the university shall have its 3rd lot of students graduating with Bachelor of Science degrees in Civil Engineering. Our graduates are well equipped to serve in the public sector from local to national governments, and in the private sector from individual homeowners through to local and international organizations. Indeed, sound training for Civil Engineers is in line with Kenya's Vision 2030 economic blueprint since the development of various forms of infrastructure such as roads, railways, airports, and water projects has been a key pillar of the national plan.

The Civil Engineering Department boasts of laboratories equipped with state-of-the-art equipment which provide an enabling platform to our staff and students for much needed research in response to modern needs. The highly qualified teaching and training staff provide the requisite guidance to the students in research, while embarking on groundbreaking research activities themselves. These, coupled with strategic collaborations with other departments within the university as well as with external organizations has seen the department grow in leaps and bounds to emerge as one of the leading civil engineering training institutions in Kenya.



Survey Class Using a Total Station



Fluid Mechanics Demonstration on a Hydraulic Bench



Leather Technology

B.Sc Leather Technology students display finished leather products they made while attached at KIRDI

Leather technology entails the synthesis, production and refining of hides and skins to make commercial goods like footwear, clothing, gloves, belts, wallets, luggage, bags, and upholstery including automobiles and sports goods. It is a niche branch of technology which deals with leather and its by-products.

Leather has played an important role in the development of civilization. From prehistoric times man has used the skins of animals to satisfy his basic needs. He has used hides to make clothing, shelter, carpets and even decorative attire. To the Egyptian lady, a fur piece was highly prized as her jewellery. From leather, man-made footwear, belts, clothing, containers for liquids, boats and even armour. The principle protective armour of the Roman soldier was a heavy leather shirt.

In recorded history, pieces of leather dating from 1300 B.C. have been found in Egypt. Primitive societies in Europe, Asia and North America all developed the technique of turning skins into leather goods independent of one another. The Greeks were using leather garments in the age of the Homeric heroes (about 1200 B.C.) and the use of leather later spread throughout the Roman Empire. During the Middle Ages, the Chinese knew the art of making leather. The Indians of North America also had developed great skills in leather work before the coming of the white man.

Conversion of hides and skins in ancient civilization was a matter of trial and error. The art of tanning in recent times relied mainly on the use of extracts from barks and certain kind of tress through a process known as vegetable tanning. In the nineteenth century, vegetable was supplemented by chrome tanning. This process uses chemicals and today accounts for about eighty to ninety percent of all tanning done except for the leather used in the soles of shoes and tooling leathers.

The formal leather industry in Kenya dates back to 1905 when hides, skins and leather development services were formed for the purpose of nurturing good quality production services within the British Protectorate of East Africa. The objective of the leather industry then was to undertake raw hides and skins quality improvement for export and earn revenue for the protectorate. After independence, the Kenya government seems to have neglected the leather manufacturing sector.

Currently, the leather sector is estimated to earn the country about 4% to the agricultural GDP and 1.5% to the national GDP. The sector is one of the key agricultural sub-sectors with potential towards creation of wealth and employment. This subsector has been identified as a flagship project in the current National policy under 'Vision 2030'.
It is estimated that the total value for Kenya leather sub-sector is Ksh. 125 billion. However, this potential has not been realized due to various challenges plaguing the sector. The challenges to the leather value chain include; inadequate skills and production capacities, lack of appropriate technology, lack of accessibility to research and development, weak linkages between value chain players, low quality hides and skins, use of old production technologies, high production cost among others.

The leather value chain faces challenges which impact negatively on this industry. There is need to address the challenges by formulating long-lasting solutions that address all the key issues along the value chain; raw material quality improvement, leather processing, leather products manufacture and capacity building. The leather value chain comprises of farmers, hides and skin traders, tanners and leather goods and footwear manufactures. The value chain addition would lead to creation of jobs, creation of wealth, technology transfer, save foreign currency, earn foreign exchange, and create market for support industries.

To address the challenges, the country needed a strategy to solve the deficiency of skilled manpower who will be the key drivers of the sector. In that regard, DeKUT has introduced a Bachelor of Science in Leather technology. By so doing, DeKUT, will bridge several gaps in the leather industry by developing skilled manpower to drive the industry to attain the country's vision 2030. DeKUT opened its door for the first student in September 2013 and are expected to graduate in 2017. Another batch of students was admitted in 2014 and 2015. The university is committed to seeing the fruition of vision 2030 of the leather sector.

The Institute of Geomatics, GIS and Remote Sensing (IGGReS) Clinches the Coveted RCMRD-SERVIR Small Awards Research Grant

By Dr.Murimi Ngigi, Steve Ochieng, Samuel Kibui, and Boniface Thaa

Dedan Kimathi University of Technology, represented by the Institute of Geomatics, GIS and Remote Sensing (IGGReS), was one of the 10 Institutions that won the prestigious SERVIR-Eastern and Southern Africa Small Grants Award. The research grant, worth USD 22,000, ran from October 2014 to June 30th 2015, culminating with a Final Grantee Workshop in Arusha, Tanzania in September 2015. The research project under this award, "A Pilot Implementation of the Land Administration Domain Model for Kenya" was jointly undertaken by a team from IGGReS in collaboration with researchers from the National Land Commission (NLC), and was funded by United States Agency for International Development (USAID) with National Aeronautics and Space Administration (NASA), through the Regional Centre for Mapping of Resources for Development (RCMRD).



Mr Samuel Kibui and Dr Murimi Ngigi, from IGGReS-DeKUT, at the Small Grants Programme Final Grantee Workshop, Arusha-September 16, 2015

This research involved the development of a prototype land administration system aimed at addressing the land administration challenges that Kenya has faced for a long time faced due to dependency on manual systems. The research was motivated by the Kenyan Constitution statement on the need for a land information management system that can facilitate land information management and sustainable development.
In the research, a solution that the NLC can use and upscale in delivering a nation-wide land information management solution to the Kenyan citizens was presented. This solution adapts internationally accepted standard models in land administration and management to the unique situations in Kenya by addressing both formally recognized and informally recognized land rights and responsibilities.

The solution uses freely available open source software stack, and builds on them a robust framework that can be used to computerize and automate many of the land related work-flows and transactions. While the ideal scenario would be to fully computerize and automate all the land-related processes, given the budgetary and time constraints, the developed pilot concentrated on converting a selected number of land-related documents, such as maps, for sections of the country targeting different land registration regimes.

The basic building block in any land information system is the land parcel as identified in the cadastre. According to the International Federation of Surveyors (FIG), a cadastre is a parcel based, and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions, responsibilities and risks). It usually includes a geometric description of land parcels (cadastral maps) linked to other records describing the nature of the interests, the ownership or control of those interests, and often the value of the parcel and its improvements. Land administration and management globally has undergone a renaissance of sorts through the development and adoption of a number of standards governing it.

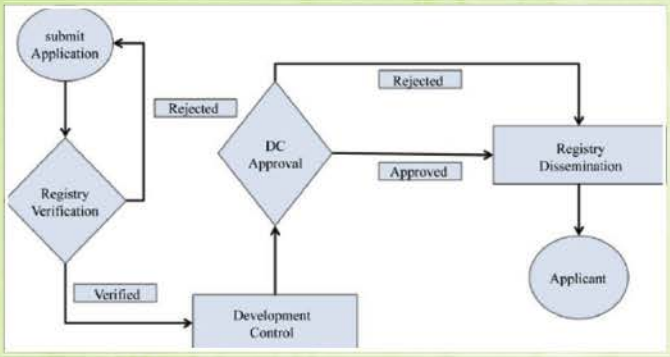
Currently, the Land Administration Domain Model (LADM) is the prevailing ISO standard on land administration and management. With the penetration of the Internet and smart devices, it is imperative that land administration, on top of using the standard models such as LADM in the design and formulation of its data models, should develop applications and services that utilize these technologies. Through the use of these models, technologies, liaison with the NLC and other stakeholders and a team of expert developers from the Dedan Kimathi University of Technology, a pilot system was developed, tested and showcased.

The overall goal of the project was to design and develop a pilot land administration and management system for Kenya. The data model behind the implementation was envisaged also to serve as a reference implementation of LADM in Africa. To realize this goal, a set of objectives were to be developed, namely:

- Identification of the various data needs to support land administration in Kenya.
- Identification of various workflows involved in land transactions that can be captured, and identifying those that need to be incorporated in the pilot project
- Mapping the information needs to the LADM.
- Design and implement a pilot implementation of the modelled data and applications.
- Evaluate and propose scaling up strategy of the implemented pilot system.

The implemented pilot land administration domain model for Kenya was a web-based land administration system (LAS) that addressed the application and processing of "Change of User" process. This process involves receiving of an application

for Change of User at the registry, assessment of fees by the development control unit, payment of fees, joint site visit by the relevant offices, such as land officer, physical planning, land survey, etc., reception of recommendations from the site visit to the approving authority. The pilot system borrows from the Ministry of Land, Housing and Urban Development reengineered process to simplify the existing processes. The developed LAS has automated this appli¬cation process as well as facilitated the sequential processing of the documents, allowing online tracking of the progress of that application processing.



Application for Change of User workflow implemented in the prototype

Application for Change of User workflow implemented in the prototype



The pilot LAS Validation Workshop, June 4, 2015

The pilot LAS was shared with the stakeholders during a validation workshop held in June 2015. This was close to the time the project itself was ending. This was monumental from a project management point of view that all planned activities had been concluded on time and all deliverables had been prepared and delivered. Of key im¬portance was the pilot system, which was the evidence of the successful, modelling and system development.

During the validation workshop, a number of issues were raised and several suggestions were proffered on the system components and functionalities. Some of these include:

- The workflow implemented left out key government personnel involved in approval processes
- The developed LAS is fully dependent on the internet and communication to the applicants is purely email based. It was suggested that the system should be improved to include communication via Short Message Service (SMS).
- It was suggested that a backup solution is very essential for the data collected and stored in the system, and it needs to be incorporated.
- There was need to introduce more security restrictionsto prevent possible data and information manipula¬tion by the wrong parties.

This feedback was used to improve on the prototype LAS, while those that could not be immediately implemented have been noted as part of the scaling up opportunity for the long-term improvement.



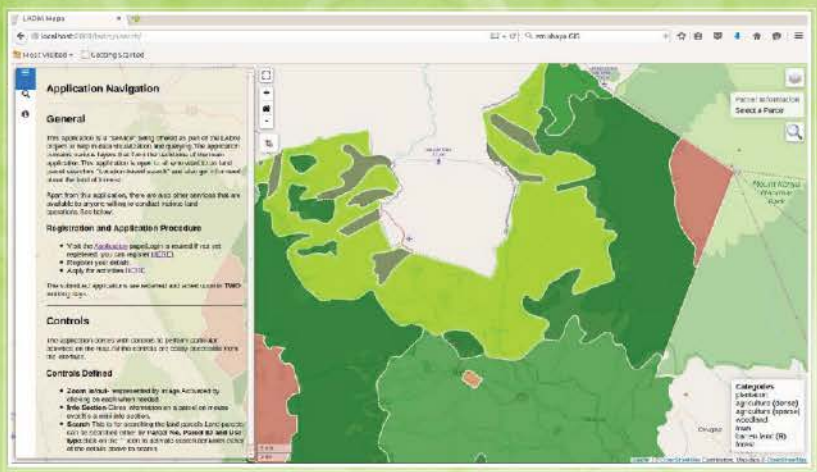
Welcome page of the pilot Land Administration System.

Welcome page of the pilot Land Administration System.

With respect to the system web interfaces, the user experience feedback picked up the following issues and concerns about the way the web application solution works:

- Web pages: Most of the users of the system were comfortable with the first glance of the LAS home page. There was satisfaction with the colours, content arrangement and position of links to other web pages of the sys¬tem. Additionally the web users suggested that an FAQ (Frequently Asked Questions) web page that would act as a guide and reference while using the system should be incorporated.
- Data: It was noted that the LAS needed more data layers to be included for the system to work effectively.
- Content: It was noted that the LAS site was available only in English, and it was suggested that it should be availed in Kiswahili also, with simple and clear diagrams that illustrated how the system worked.

The prototype LAS developed implemented only the "Application of Change of User" process of the development control in land administration. For the system to be beneficial to the community that it is meant to serve, it is of essence that the prototype gets up-scaled. There needs to be in place, good strategic planning for the up scaling process. The scaling up strategy needs to be incremental and continuous over time, allowing the system to evolve in terms of its offerings. The key elements in this up-scaling should be: system improvement, resource team and supporting organizations. Dissemination of information and data, organization of up-scaling process, resource required, and monitoring are essential for the success of the scaling up strategy



The main deliverable was the pilot system developed towards the end of the project. This is a web based land administration systems managing the process of change of user. This process is a representative of how all the other processes involved in land administration can be implemented. The system employs a centralized database, which holds the spatial units, the land records (documents) and information about the parties involved in land administration. The system features paperless transactions in the land administration. The pilot system is important in addressing the issues of automation of land information management in the Kenya. Digitizing the land administration transactions and elimination of paper records means a lot as flaws that regularly occur are eliminated and confidence in the land administration processes will as a consequence be bolstered.

Alongside with the application, this research produced a comprehensive report on the implementation of the LADM standard in the Kenyan land administration sector. This report addresses generic issues covering the opportunities that are available and the challenges. This report is adaptable to any other developing country especially those with similar structure as Kenya in their land administration domain. Other deliverables are the analyses reports on the various workflows, the user requirements document, the adapted Land Administration Domain Model and the methodology for implementation of the system. These are important in addressing the issues of automation of land information management in the region.
Good and efficient land information management is acknowledged as one of the key drivers of sustainable development and forms the basis for a strong and sustained National Spatial Data Infrastructure (NSDI). Part of the infrastructure that has been used to host the pilot system will be reused for the NSDI when implemented, thereby reducing po¬tential for redundancies and duplication of efforts and data.



The Pilot LAS Evaluation Workshop, June 4, 2015

Acknowledgements: The research for the project was made possible through the generous support of the American people managed by USAID through its RCMRD/SERVIR-Eastern and Southern Africa Small Grants Program.



DeKUT THE UNIVERSITY OF CONQUERORS

By: Dr. Juma Misiko-Ag. Dean School of Graduate Studies and Research and Aseremo Mogaka Nyamwamu-Finalist student –BSc. Industrial Chemistry.

Universities are institutions of higher learning, where technical knowhow and life knowledge are developed and acquired. It's at the University that one's experiences are enhanced and appropriate character nurtured and shaped. Physical, mental, intellectual and spiritual growth and developments are vital aspects of an individual's wholesome progress. Guided by the core values (innovation, scholarship, diversity, integrity and teamwork), Dedan Kimathi University of Technology, is keen on developing and nurturing all-rounded conquerors. Life is a journey and without appropriate gears and thinking, frustrations, worries and fears cannot be overcome. Conquering these 'human maladies' requires one to subdue him/herself first! It's about stretching beyond the comfort zone limit without orchestrating spiritual deformation. One who is able to transcend what the physical body considers limits and pursues the will and enthusiasm of the spirit, is more than a conqueror!

Climbe to educate "initiative" at Dedan Kimathi University of Technology goes beyond fun making and philanthropic gesture. It's about imbuing the much needed yet rare soft skills and virtues that are critical to life success for staff and students.

Humility

"Great leaders don't need to act tough. Their confidence and humility serve to underscore their toughness" Simon Sinek. The "Climb 2 Educate" expedition subjects climbers to conditions that make one humble without choice! At the Sirmon gate, hikers were divided into teams; each consisting of diverse individuals different ethnic, profession, strengths and weaknesses grounds. The climbing rules are simple 'move as a group'! The strongest (fastest) were compelled to walk at the pace of slowest person in the group. As it is human nature, the aggrieved (fastest) sulked and frowned at the slower comrades. There was little the former could do. They had to keep up with the tempo of the slowest hikers if at all they wanted to reach point Lenana. It is true the fastest climbers had the strength to climb faster, and of course they displayed it to the extent of intimidating the slowest climbers, the climbing rules made them swallow their pride. As the hiking went on towards the Old Moses camp, the fastest climbers found themselves trekking at the slowest hiker's pace chatting and exchanging pleasantries. Biblically, those who humble themselves are lifted. Walking as a team, chatting and exchanging generated positive energy that made groups conquer hills after hills and altitude after altitude. When people collaborate without putting their ego first, they accomplish a lot.

The expedition attracted staff, students and friends of the university. Interestingly, it was impossible to note such social status. Roles were equitably distributed irrespective of one's position. Students, Staff and Friends of the University participated in cooking, washing utensils and other duties assigned by team leaders, who were students. It was challenging for the students at the start, but as the climbing went on the interaction and bonding that ensued erased the social status. Humility as a virtue is key. It creates friendliness and security, key ingredients for fruitful interaction and collaboration. It's the doorway to patience and humane understating.

Endurance

Mountain climbing is a risky adventure. It's not the kind of activity many would like to partake in more often. Human life is a risky venture in itself. Every day one has to make decisions, some of which their consequences are so dire to the point of breaking one's spirit. One shouldn't give up no matter the percussions life brings to mankind. Endurance was well



exhibited on day two, when climbers were to add extra load on theirs. The extra load was food supplies for lunch and dinner at the Shipton camp. For instance in my group, I was to carry five loaves of bread. Surprised? Don't laugh at this yet? Believe you me, when climbing a mountain even a milligram can turn out to be several kilograms! Just like some decisions people make can drastically evolve into a monster and devour the decision makers. Climbing expedition is exciting but the prevailing mountain weather conditions can cause unimagined fatalities. Only climbers can validate this argument. As one conquers the altitude, one's breathing pattern changes to correspond to the ascend. At times it is so abrupt that one can easily gasp. It's normal during mountain climbing. Furthermore, it comes a time when small rocky hills seem insurmountable and the legs become unwilling to make the one step needed to make the altitudinal difference. It also happens that sweets and biscuits become unpalatable due to lack of appetite and climbers are forced by instructors to seep water. Brief, the physical body becomes exhausted; emotional irritation surpasses the tolerable point, pretence gives way to reality, where individuals exude their true characters. At this point it is not the personal physique that determines who will conquer point Lenana but the positivity of the spirit and mind. When these two are in unison, endurance sets in automatically. The power to endure resides in climber's determination, appropriate focus and interest in conquering point Lenana. There are no shortcuts to point Lenana; the route given by guides and instructors is final. Despite the physical and emotional challenges climbers encountered, none of them ever discovered an easy shortcut to point Lenana. At times, especially during the final assault at 4:00 AM, climbers reminded themselves of the early man's walking style (quadrupedalic). The route had loose pebbles and without appropriate foot grip climbers risked slipping and falling back. Where else could such innovativeness be demonstrated except at an occasion such as mountain climbing? Climbers overcame every challenge and risk in order to reach point Lenana, the highest point the flag of Kenya is hoisted and the holy book (Bible) is kept. Climbers shed tears of joy while others looked back at the distance they had traversed and murmured prayers of thanksgiving to the creator. All this happened because the climbers chose to endure! Life needs people who are focused; determined, interested in whatever they do and ready to operate outside their comfort zones. Nothing noble comes on a silver platter. It is risky being outside one's comfort zone but it is rewarding in terms of achievement. Life is a battle, winners chose the unbeaten track. Mountain climbing is not like visiting a national park or game reserve to observe and enjoy game viewing from the comfortable tour van vehicle. Hikers sleep in tents where the uneven and semi-dump camping grounds always remind them about their comfortable 'king size beds'. Every step a climber made counted, and in life every initiative one undertakes in the right direction leads him/her to success and self-fulfillment. Wealth can't be created in a single effort, its takes considerable time of hard work, determination and interest to realize it. A true climber, soldier can endure the vagaries of life to get what he/she wants. All the impossible are interestingly possible to a willing spirit.

Teamwork

There is a Swahili saying that goes 'Kidole kimoja hakivunji chawa'. The saying underscores the need for teamwork. After being subjected to the crushing weather conditions, teamwork was the only consolation and strength in the wilderness. It was exciting to observe climbers warming their hands in turns around the cooking stoves to scare off snow bites. Courtesy of teamwork some braved the freezing temperatures to wash utensils and perform kitchen related chores while others pitched tents to ensure that everything was accomplished on time. Teamwork experienced during the expedition was dictated by the prevailing local context climbers were in. Teamwork was spiced by the virtue of sharing. Sharing can at times be challenging. The fear of shortage of stock and the costs associated with sharing may inhibit the expression of this noble virtue. However, while climbing none of the vices diminishing the art of sharing had a chance. Hikers learnt to share whatever they had. Whether it was strengths, snacks, fruits, ideas, stories, time and water were shared across the board irrespective of one's group. In life, one can't achieve in isolation, he/she needs the others. That is why DeKUT prides in having teamwork as a core value. What came out from the expedition was that it's impossible to climb the mountain in solitude. Climbers need that voice saying behind or ahead of the saying, 'push on, we can make it, we're almost there, we are on the right track, come back you're getting lost'. Those words were like sweet aroma and grease to an exhausted physical body. In life, or any working environment there are times when people get exhausted and all they need is a hand to support them. Conquering the mountain helps hikers to be conquerors in other aspects of life. What sort of life challenge would elevate itself higher than a mere point Lenana?

In conclusion, the climb to educate is a blessing in disguise. Climbers left the mountain more physically fit than they came. Several calories were left on the mountain for the gods that patrol the tracks. This applied across the social divide. Training and working at DeKUT, or simply associating with the University, makes one a conqueror. The virtues inculcated are practical and those who possess them already have theirs improved. Such values are what are expected of men and women of integrity! Students not only get a DeKUT certificate, but they are also given a chance to conquer their selves, mature and leave the university responsible citizens ready to positively turn life's frustrations, worries and pains into opportunities. Long live Dedan Kimathi the University that identifies mentors and nurtures conquerors!

DEDAN KIMATHI UNIVERSITY HUB (DeHUB)

By Mr. Kenneth Njihia
DeHUB Project and Community Outreach Co-ordinator

Dedan Kimathi University of Technology opened the first innovation centre outside Kenya's capital city, Nairobi, The Innovation Center will change the scope of tech for students at the university. The students have been producing game changing innovations that generally simplify the way of life. These innovations are applied to the societal needs and provide a platform for these students to become entrepreneurs.

By 2014, innovation centers had become the avenue for Tech bigwigs like Google, Microsoft and Apple to tap innovations from. March 16th, 2015 was therefore a big day for anyone with a dream to become an entrepreneur, as the then Cabinet Secretary for Information Communication and Technology Dr. Fred Matiangi cut the ribbon to officially open the newest innovation centre on the maps of the tech world, The Dedan Kimathi Hub (DeHUB).

At this point all we could say was "go big or go home!"
DeHUB came about with the objectives of facilitating the application of information, imagination and skills in deriving greater or different values from resources leading to national development , nurture an entrepreneurial culture, to build the capacity of different stakeholders in the economy through consultancy, mentorship and training among others. DeHUB has achieved all the above in one year.

DeHUB is a center that finds, trains and supports students who are innovative and entrepreneurial. DeHUB also develops programs, projects and forward-thinking initiatives that bridge the digital divide. The centre supports startup founders with high-growth companies and game-changing ideas and connects them to an unmatched network of investors, mentors and influencers. The startups are able to develop using DeHUB startup tool kit and hone their leadership skills on the entrepreneurial journey from the first phase to exit.

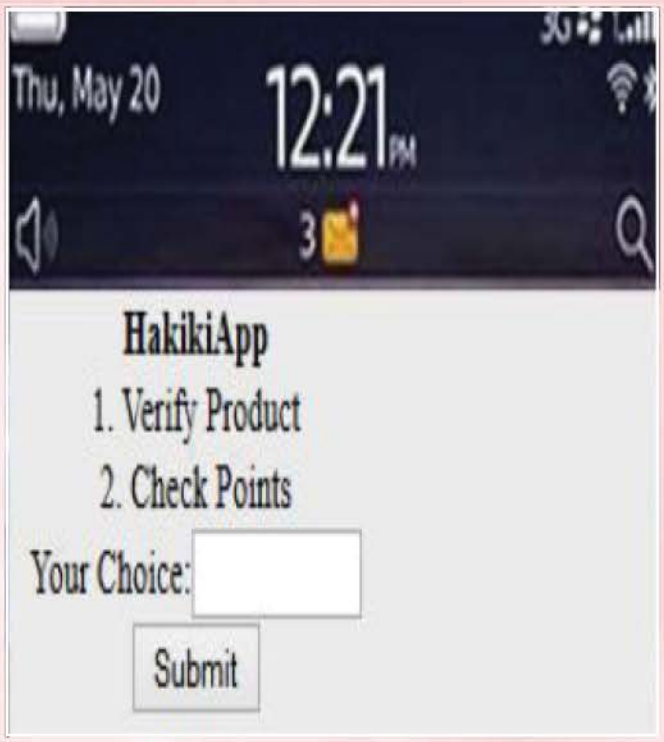
The HUB has registered over 270 members and 17 commercially viable projects from students. The centre has been organizing mentorship programs with the industry companies to mentor the innovators to become the best in the market.
Membership program:

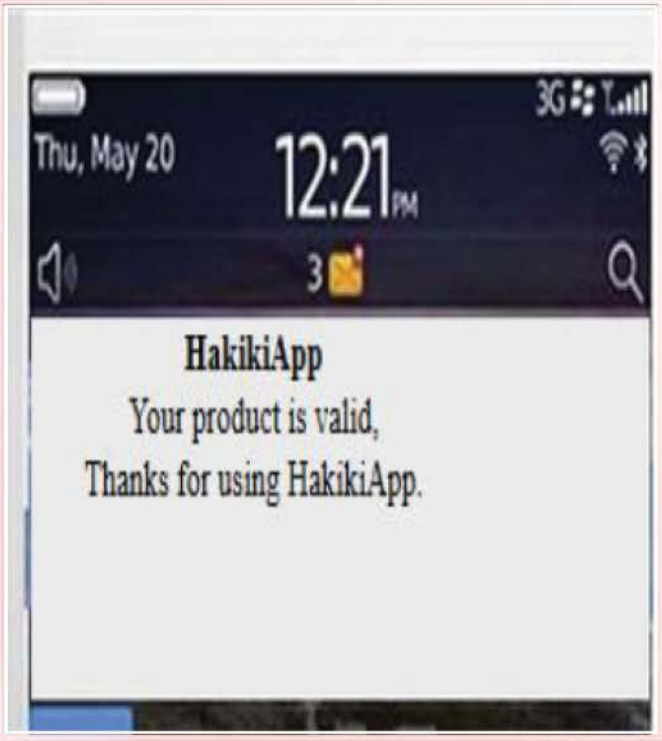
DeHUB has three membership packages which have different benefits to members. KIFARU, NDOVU and SIMBA. In the course of the year, we have had students' innovators from across all programmes/ courses. Nelion Farm, HakikiApp and ElectruxxAnimations are but a few of the projects we have in the hub.

Hakiki App

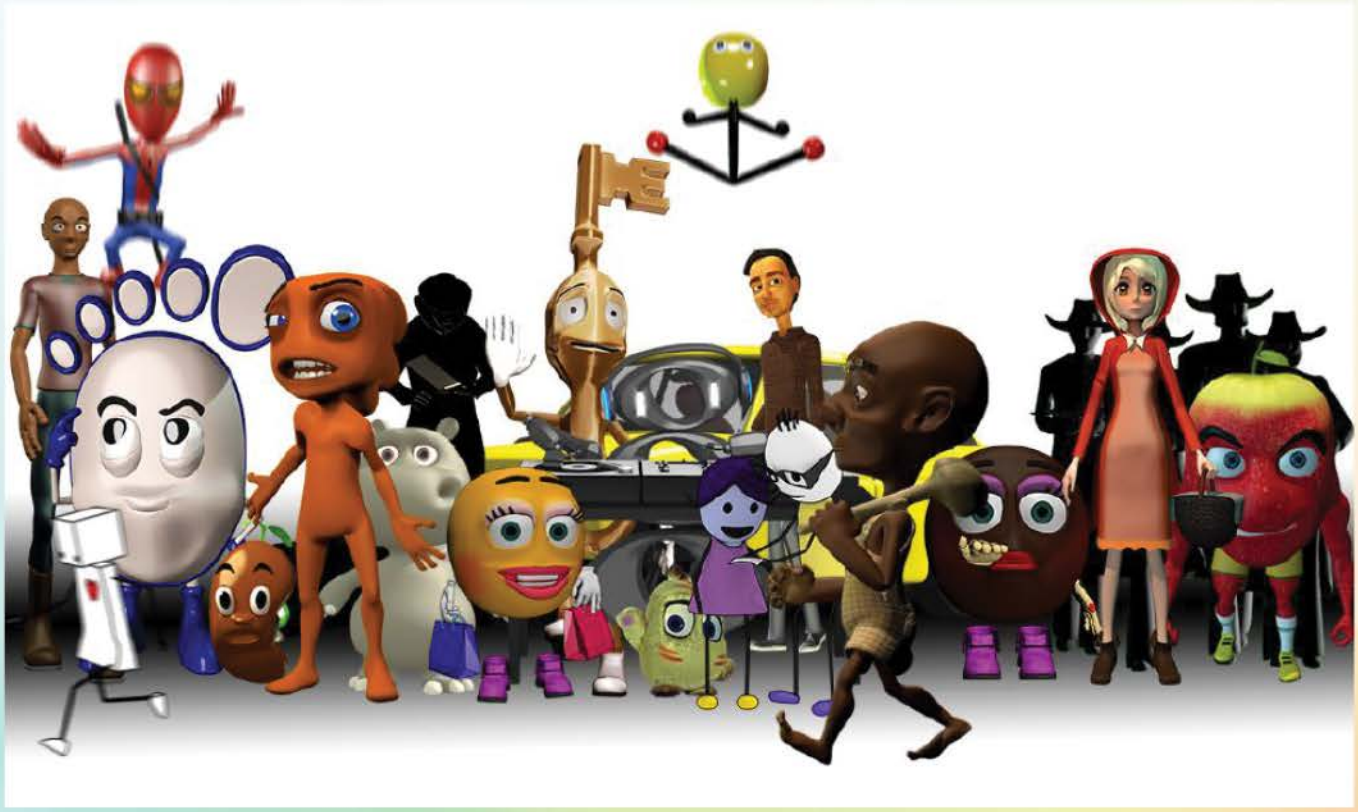
Hakiki is a Swahili word which comes from the word 'hakikisha' meaning "to verify". You may ask, what do we verify? Theres is the liquor business. In Kenya, many deaths have been caused by consumption of illicit liquor. Hakiki App mission is to eliminate all deaths caused by consumption of fake liquor. Almost every family in Kenya has faced the problem of addiction or death due to fake liquor consumption.

Hakiki is an application that runs on the Unstructured Supplementary Service Data (USSD) platform. Unique codes are generated and stored in Hakiki database. The liquor manufacturer is given the same codes which are put on the bottle tops before the liquor is released to the market.Once the consumer buys the liquor he/she checks the code from the bottle top and uses Hakiki to verify. The Consumer will dial a code e.g. *144#, then he/she will be prompted to enter the code. Once the code is verified,the user gets a short message confirming that the product is from the said manufacturer.





3.ElectruxxAnimations



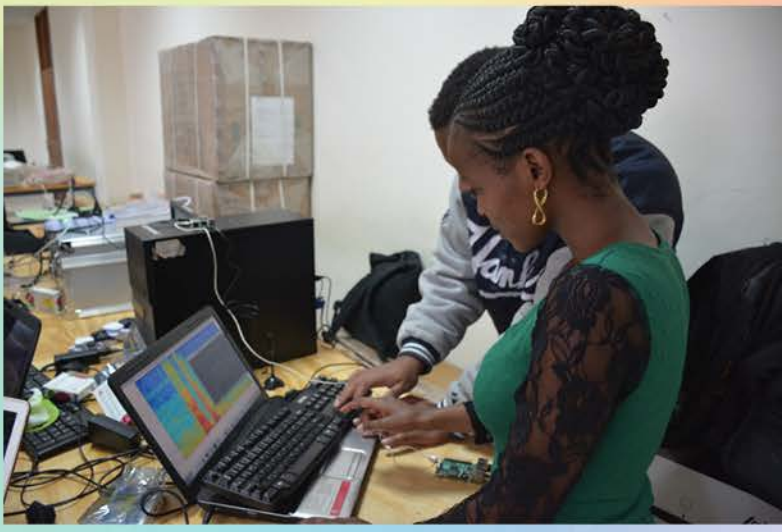
ElectruxxAnimations

3d animation and computer graphics design

Electruxx Animations consists a group of three students who have come together under DeHUB as a startup company. Electruxx Animations goal is to augment your marketing materials with 3D animations and realistic renderings for large audience reach.3D Animation is a powerful marketing tool that enhances presentation of a company's product, concept and ideas to the potential clients, customers or investors. Alongside blueprints, diagrams and verbal description, 3D animations delivers to the customers a complete three-dimensional photorealistic or artistically stylized representation of the final product that has not been built yet. Electruxx Animations pay close attention to the smallest details of your project, high level of professionalism and creativity. The startup works with other Advertising Agencies, Gaming companies and Media Production Companies that need 3D rendering or animation services.

Electruxx Animations designs and animate compelling visuals with a passion and excitement shared with the clients. Electruxx Animations team is committed to customer service, reliability, and ultimately the production of high-quality deliverables all fields.

The team members are: Donald Njeru Shelton, Ochieng Odongo and Michael Makau





E-LEARNING, CREATING OPPORTUNITIES IN DeKUT AND BEYOND

ICT and the internet is among the emerging technologies that has, without doubt, had a great influence in the modern society. Through them, new information society has emerged. It's a society in which ICT has been identified as a major facilitator of social economic activities. Some scholars call this society a self-service society. Among the differences made by ICT are the nature, the structure and the packaging of service delivery including Educational services.

E-Learning is delivering and accessing education services electronically. It is a mode that is cost effective for both the Learner and the education provider. For the Providers, E-Learning enhances the quality of their services, simplifies learning delivery, provides a wider market reach thus reducing the cost of production and delivery and facilitates them to gain a competitive advantage among other benefits. For the students, E-learning makes education more affordable for citizens and other constituting elements and in the process, like other e-services, make crucial contributions towards an enabling environment for social, economic and academic growth.



Figure 1: DKUT

Dedan Kimathi University of technology is among institutions of higher learning in Kenya whose progress in E-Learning is notable. We started implementing blended learning in 2011. Initially it was aimed at enhancing quality of delivery of lectures, where the students were facilitated to easily access lecture notes, demonstration videos, e-library, e-books and e-journals. This has gradually changed placing E-Learning as a key avenue of delivering lectures both on and off campus online. And in the spirit of the modern self service society, DeKUT students can today receive lectures in real time irrespective of their geographical location. Those who miss the lectures can access a recorded copy of the same online at a time of their convenience.



The university through the E-Learning center and in collaboration with the ICT department has implemented state of the art facilities and platforms for online teaching. This has enabled both time and space shifting; allowing students and lecturers hold fruitful discussions and consultations through online forums any time of the day. We have one of the best Video Conferencing Facilities (VCF) that aids in delivering real time synchronized lectures in both Nairobi CBD campus and the Main campus.

We have several courses now being offered purely online through the university e-learning portal, with lectures being delivered to DeKUT students from across the globe. The online classes are delivered through BigBlueButton that is powered by KENET. The platform enables us to stream live lectures for both undergraduate and post graduate courses within and outside campus. Fig 2 above is a snapshot of PhD students in Nairobi Campus attending a class that is being delivered from the United States of America. Our platform also enables students to receive and upload assignments online in a secure, highly monitored and controlled yet friendly way. All this is aimed at improving the student's campus experience.

The dream for a virtual campus in DeKUT is no longer a mirage, but a tangible reality. The E-Learning team in collaboration with the Institute of Tourism and Hospitality Management (IToHM) is working on launching the degree program virtually before the end of the year. This is aimed at providing opportunities to students to access quality degree education remotely while still pursuing their career. The ultimate goal, in regards to this, is to replicate this to every other course, thus making University education universally accessible in Kenya and beyond while still retaining high quality standards. We indeed live the DeKUT's motto "Better life through Technology".

As we celebrate the 4th graduation ceremony, I congratulate all the graduands, on behalf of the E-Learning team, and wish them a happy and fruitful career life. We, the E-Learning Center team, are proud of you. Should you consider coming back, we assure you of our dedication in enabling you further your education here in DeKUT



MR. MUCHIRI MICHAEL NJOKI
DEPUTY DIRECTOR,
E-LEARNING CENTER
DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

Nelion Farm, The next Big Thing in Farm Management



By Esther Kaburu

Stranded on how to make farming easy and fun? Nelion Farm has a solution for you.

Kenyan farmers rely too much on nature for their produce, which is not as effective. We, Nelion Farm, believe that farming in Kenya can reach its peak by embracing modern technology, where information and data analysis is readily available and accessible by anyone from anywhere.

Nelion farm is a smart device that monitors a farm and regulates it as per the preferred conditions. This concept is applicable in many areas that involve farming and it can also be implemented through different approaches. It is a hybrid of various concepts that could be useful in tackling agricultural related problems in effort to yield better results for sustainable agriculture. The device uses a variety of sensors to read the atmospheric conditions, as well as a microcontroller which regulates the conditions. The connected devices and sensors collect data and give smart recommendations based on the various variables leading to higher productivity and more effective use of land, water, fertilizer and other resources.

One of the most amazing features about the Nelion Farm is access over the internet; the farmer can control the greenhouse easily with his or her smart-phone, through a user friendly app, which is easy to understand and operate. The device also gives live stream of what is going on in the farm. Once a camera is attached, the farmer can be able to stream what is going on in their farm remotely. The system regulates 6 elements which are: Humidity, Temperature, Soil Moisture, Air flow, light and soil pH. The app then suggests a particular pesticide to the farmer and where they can get it depending on their location. I addition, the sensors detect ripe products or even weeds and recommends herbicides and where farmers can get them from, especially companies partnering with Nelion Farm as they are in Nelion Farm database. Other agriculture related businesses and events could also advertise to the farmers through the Nelion app by having partnerships with the company.
This has been made possible by three Mechatronics Engineering students (Muriungi Kithinji, Cyrus Kiiru and Denzel Wamburu) under the support and guidance of our innovation and incubation centre (DeHUB) whose main purpose is inspiring innovation and entrepreneurship by way of transforming innovative ideas emanating from within and outside DeKUT community into products, processes and services for commercial exploitation.

This is an indication of the great potential among our students and staff and an assurance that we are indeed moving towards our vision of being a premier technological university excelling in quality education, research and technology transfer for national development.

Road to the **Wild**

- By Amos Kirui
3rd Year Computer Science Student
Member BAKE DeKUT
www.cheruiyotkirui.wordpress.com

Climbing Mt Kenya is one of the hidden gem in East Africa. From the dusty lowlands of Nanyuki through the Rain Forest just after the Sirimon gate to the beautiful vast land of alpine heath to jagged volcanic rocks and glistening glaciers in the peaks .

Trekking through the sirimon route provides favorable conditions as it is in the drier part of the mountain and trails are accessible through to the peak by enthusiastic hikers. It also provides accessibility for the vehicle all the way to the first camp, Old Moses.

Sirimon route is more scenic than Naro-moru. Just after the gate, the forest starts. Cool and fresh breeze is felt. The beauty of flora is at a glance. Wide variety of trees species could be identified, depending on the zones that differs due to temperature, rainfall, aspect and altitude. Mixture of trees at the base to the noticeable podocarpus which is dominant in the montane region, and fewer giant heath to bamboo trees which habituate the upper montane region.

The altitudinal zonal demarcation is witnessed after the bamboo forest, the zone contains almost every species of plant hence referred to as ecotone. This is due to favorable conditions present. Then the timberline forest starts, characterized by hagenia. Directly above the tree line is heathland,favored by the wet grounds. Mt Kenya everlasting colonises the zone.

Our first camp, Old Moses is just within the heathland zone, 9 km from the gate it's 3300m above the sea level. We stayed there overnight to acclimatize ourselves with the weather conditions . A bit cold and windy. Water takes hours to boil. Cooking is a different story. The tents have already been pitched by porters, a tent could accommodate four people. Each with his/her sleeping bag. I was ready to face the night. All my clothes on, inside my sleeping bag till the following morning having in mind that the next camp was 14 km away. But I was physically and psychologically fit for all these hikes, you know.

We departed from old Moses at 9:30 am. I made sure that I was just after the guide so as to get some questions answered. Shipton camp, named after Wyn Shipton, is 14km away and 4200m above the sea level. Evidently it's colder than old Moses. The track goes through the Vast land of Mt Kenya-everlasting vegetations. Beautiful to the eye. More beautiful when they flower. The vegetations here are smaller so as to adapt to the extreme weather conditions. I cannot skip mentioning the mountain cabbage, food for the mountain rats.



At old Moses

Contouring right through the moorland and a valley, Liki Valley . The valley provide a panoramic view of the peaks. It's a picturesque, breathtaking and sun-drenched Valley. Then there was an opportunity to refill the water bottle in the Liki River. We could see a trail on the opposite Ridge. The ridge is 3700m above the sea level.That could lead us to our stop over for a lunch. The trail was wet and very sloppy. Remember that we had backpacks,that added the weight. The rocky ground witnessed by huge boulders was our dining tables and a photo session took place



To shipton



after. The valley just after the descend is Mackinder Valley with the stream in it. The peaks could now be seen and even take a photo of them. It has glistening ice that kept the cameras rolling. Shipton camp is just halfway.

We're now rejuvenated having taken lunch. Ready for a 3-hour journey. The stream throbbed with a waterfall-like sound. It looked insignificant contrary to its sound. The zone changes hence the vegetation characterized by , Lobelia teleki, and giant groundsel. Slowly, we made our way down the valley, it gradually rises and the trail joins the river again. A chance to refill the bottle of water again. This is the secret success of hiking; eat eat eat, drink drink drink,sleep sleep sleep. The trail goes on and ascend a little bit to 3950m. We could see two peaks on the left, Sendeyo and Terere peak and to our right is Batian, Nelion and Lenana to the far end. A sigh of relieve having seen the green iron sheets, that's Shipton's Hut. The place just catches the eye. I had to dig in my pocket to pick out my Sony camera and the phone as well. I couldn't do without them. Photography is my other passion. Shipton is here.


Panoramic view of the peaks

The night at shipton was one of the memorable nights ever. The cold would be felt throughout the body to the feet. It was unpleasantly cold, dark and mystifying. You could handle the burning gas and feel like you can't get burnt. Were it not for acclimatization at old Moses camp, we couldn't have stayed at Shipton that long. It's Hell cold. The tent wasn't favourable at night. I had my nightmare. The ground was a bit boggy. Presumably that's why it was indeed that cold. The peaks are glittering even as far as we were in the camp. Their formation escapes our human comprehension.


Giant groundsel

4 am, took my coffee to regain the warmth. The journey to the peak starts. My climbing gears on. Gloves, shades for protecting UV rays, warm layer and a wind breaker, though this clothing could be discouraged by the instructor since I could generate heat as I walk up the mountain. The trail is quarry that cuts through a cliff. It was still at dawn, only torches could be seen. It's dangerous if you don't put on boots. You could easily slide and sprawl down to the rocks down the cliff. Some would go with four limbs,nevertheless the guide


At Mackinder Valley


Lobelia teleki



Sendeyo and Tereri peaks

would say we 'trust' our boots and neglect the two fore limbs. What?!

The morning sunrise got us in our way. We could view where we'd came from. It was frightening. The destination peak is halfway. The perched and rugged valleys took the better part of our viewing. Batian and Nelion to our right, opposite are their grandsons, Sendeyo and Tereri. Just after the ascend on the trail , it's Hariss tarn Or Lake Harris if you like, it's 4750m above the sea level . It couldn't go uncuptured. Water depressions are quite a number here. I had overtook my guide, no one to ask about their names. The climbing resumes. Angry petrified rocks that could cut your feet is witnessed here. I almost landed to a trouble,I stepped on a slippery rock which could have changed my dental formula!

A sigh of relief! The Lenana peak is here. Cold and cold. My Masai shuka got repeatedly buffeted by howling wind. The site is almost inaccessible. Frost bites here are noticeable. No room to remove your gloves to touch your phone's screen. A little ascend sent me to the top top point Lenana. I had conquered the Point Lenana! 4985m above the sea level. I couldn't get happier than that! The Kenyan flag and Bible placed inside a stand are my witnesses. The wind and cold were uncontrollable. You can easily suffer from hypothermia if you stay longer than 15 minutes. Hands could almost hold nothing, camera would easily fell out of hands. High altitude, cold, endurance and passion interplayed together to make my climbing successful.



Sendeyo and Tereri peaks

This was nature at its finest.

The beauty of the lower grounds overwhelmed the eye. Land stretches could be seen. Some covered by clouds and some snow. Point Nelion,5188m above the sea level separated with point Lenana by a gap that scares the eyes with a huge ice coverage. Climbing Nelion and Batian needs more technical training. It's for technical alpinists. It's dangerous and dead is once! I'll try when I grow up. Point Nelion and Batian are within 250m reach, separated by Gate of the mist gap. Other noticeable peaks are ; point Piggott, point Dutton, point John and many more.

From point Lenana, we descended to the Shipton camp, take a rest and a heavy breakfast then backed our stuff and trekked all the way, leisurely, to our first camp, Old Moses in a long day for a dinner and overnight before we could trekked to the main gate for a bus connection back to home. Perhaps to take a shower having spent 4 days without simply because of the heck cold! You can try if you trust your biology of being warm blooded. Boiling it all down, I owe my success in climbing to my outdoor instructor, Mr Mwai Kenedy.



The DeKUT Farm, a Production, Research and Farmer Outreach Outfit

By John Gathirwa
DeKUT Farm Manager

DeKUT Farm is a mixed farming enterprise located approximately 6 km from Nyeri town along the Nyeri – Mweiga highway. The farm is at an elevation of 1750 meters above sea level on deep volcanic soils. DeKUT farm was established in the early 20th century by European settlers. In 1978, Kimathi Institute of Technology, the predecessor to Dedan Kimathi University of Technology, acquired Nyeri Plantations. Nyeri Plantations was established during the 1950s, by the merging of two coffee estates – Faruvale and Gunyumu.

The farm has three main sections; coffee, livestock and horticulture which are used as a demonstration for teaching and research for the University and community. The produce from the farm is consumed internally by students and staff and the rest sold to the community.

Coffee section

DeKUT coffee is a major component of the University farm. The farm produces top quality Arabica coffee due to its geographical location, climate and soil profile coupled with the best agricultural practices and the processing of its coffee.
The activities carried out by the farm includes; sowing the beans in propagators to produce coffee seedlings, transplanting the seedlings into poly bags, nurturing the seedlings till they are of age, transplanting the seedlings and supplying the seedlings to the community. In the coffee fields the agronomical practices like weeding, fertilizer application, irrigation, pest and disease control and pruning are carried out prior to harvesting the cherries. In primary processing; pulping, fermentation, washing of the mucilage and grading in terms of density is undertaken. The grading at this level gives four different parchments i.e. Parchment one(P1), Parchment two(P2), Parchment three(P3), and Parchment Light(PL). The parchments are then dried to a moisture content of 10.5 - 11.5 before being packed and stored in a well-ventilated store awaiting delivery to the mill where secondary processing is undertaken.

The milling of coffee parchment is done in DeKUT coffee Laboratory under the Institute of Food and Bio-Resources Technology (IFBT). The dried parchment coffee is milled/ dehusked and graded into seven grades; AA, AB, PB, E, TT, Tand UG before roasting and grinding. The product is then packed in packages of 100, 250 and 500 grammes.

DeKUT farm has three coffee tree nurseries with a combined capacity of 210,000 seedlings. Each nursery measures 12 meters by 70 meters. The nurseries house Batian and Ruiru 11 coffee tree varieties. Certified seeds sourced from the Coffee Research Institute (formerly the Coffee Research Foundation) are utilised. The coffee tree nursery project was started in 2011 with one nursery. In 2014/2015, two additional nurseries were constructed with funding from the European Union through the Coffee Research Institute. The coffee tree seedlings in the nurseries are available at a subsidized fee to the farmers, coffee estates and cooperative societies.

DeKUT coffee farm comprised of SL28 and SL34 varieties. In April 2013, DeKUT farm initiated a rehabilitation plan for the coffee and began replanting the farm with new coffee tree varieties (Ruiru 11 and Batian) with the aim of increasing production in the long term. The farm has replanted a total of 129,000 new coffee trees as at March 2016. At the end of the rehabilitation period, the farm expects to have a coffee tree population of 221,821.



Potted coffee tree seedlings inside DeKUT coffee nursery



Coffee cherries on Batian tree



Young planted coffee trees





DeKUT premium coffee



DeKUT Coffee Nursery

DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY
OFFICE OF THE FARM MANAGER

COFFEE SEEDLINGS FOR SALE AT DeKUT FARM

Dedan Kimathi University of Technology through the Coffee Productivity Project offers coffee seedlings for sale. The two varieties currently on sale include Ruiru and Batian

Advantages of Ruiru and Batian over SL Seedlings variety

i. They take 18months to mature and harvest
ii. Highly resistant to pests and diseases.
iii. Remarkable productivity per coffee tree
iv. Propagated from high quality certified seeds
v. The picking period is short due to uniform ripening.

In attesting to these advantages, DeKUT in her coffee rehabilitation programme has planted over 120,000 seedlings and the activity is ongoing. Come join us in making coffee our pride.

Price

One tree seedling costs KES 25 (twenty five shillings only).

You can reach us through: P.O Box 657, 10100 NYERI
Cell Phone: 0701 782 823 Or Email: farm@dkut.ac.ke

Livestock Section

Dairy

DeKUT farm maintains a medium sized herd of high quality Friesian dairy cows. The cows are maintained in a semi-zero grazing set-up. The farm produces fodder - maize, lucerne and Rhodes grass hay to feed the cows. Milk produced by the dairy is internally consumed by the University catering department, University staff and students.







Photo of baling hay

Pig production

Pig production was initiated in 2012 with the construction of a piggery building and the procurement of one boer and two gilts.

The porkers are allowed to grow to size (6-7 months) and slaughtered for consumption by the staff and students. The current number of pigs is 43



Horticulture Section

DeKUT farm produces a variety of vegetables. This includes Kales, Spinach, Tomatoes, Irish potatoes, Courgettes, Brinjals and Bananas. The farm is expanding the area under horticulture. Recently three more green houses were installed to give a total of five which are under tomatoes production.

LAUNCH OF DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY COFFEE NURSERY: A SUCCESS STORY OF COFFEE PRODUCTIVITY PROJECT (CPP)

By John Gathirwa - DeKUT Farm Manager

The launching of DeKUT Nurseries marked a milestone of the coffee productivity project. The launch was held on 18th March 2016 and graced by the Nyeri county governor, with more than 120 stakeholders witnessing the launch.

The participants were drawn from coffee stakeholders namely; coffee directorate, coffee Research Institute, Cooperative societies, individual farmers, large scale farmers, CPP beneficiaries, Nyeri county government, University staff , University students among others.

The coffee productivity Project (CPP) is funded by European Union (EU) through Coffee Research Institute (CRI). The aims of the project were to: raise high quality coffee seedlings, sensitize stakeholders on the importance of growing the high quality coffee seedlings, avail the quality coffee seedlings to the community; Small scale farmers, large scale farmers, cooperative societies, coffee factories and other interested groups, subsidize seedlings prices, assist in rejuvenating coffee industry through increased production.

One of the main activity of the project was to construct two units of coffee nurseries measuring 70 Metres x 12 Metres. Each of the coffee nurseries has four (4) propagators that are used for germinating the coffee seeds. Each of the propagators measures 1metre x 7 metres and has a capacity of holding 2.5 Kgs of seeds for germination. Each nursery has a capacity to hold 70,000 coffee seedlings.

The project has managed to raise 106,000 Batian coffee seedlings which are ready for sale to farmers and to transplant in our university farm fields under the coffee rehabilitation programme. A total of 5450 coffee seedlings have been sold to farmers and 30,000 coffee seedlings have been transplanted in DeKUT farm.



Guests arriving at DeKUT Farm



Nyeri county Agriculture Executive unveiling the plaque on behalf of the Nyeri County Governor, Hon. Nderitu Gachagua



Coffee productivity project Plaque



Participants take a photo to mark the official launch of coffee nursery



The Nyeri County Executive for Agriculture, Robert Thuo officially opening the CPP coffee seedlings nursery by cutting a ribbon.



The Director Coffee Research Institute takes the guests through the importance of raising and planting high quality coffee seedlings.



The Farm Manager briefing the guests on the progress of the project. Looking on from right is the DVC RTMCL, Prof Wambua, DVC A&F, Prof Gachari. To the left is County Agriculture Executive, Mr. Robert Thuo and the Director Coffee Research Institute, Dr. Elijar Gichuru



Guests viewing the propagator where the coffee seeds are germinated.



The guests exit from the coffee nursery. On the edges of the coffee nursery to the right are the seedlings being hardened-off



Nyeri County Agriculture Executive plants a coffee seedling to mark the official launch of the Coffee Nursery



DeKUT Holds her First Annual Charity Golf Tournament

By Faith Mutheu
Public Relations Department

They say the actualization of every great idea begins with the first step. DeKUT is well on its way to achieving its dream of providing quality education to all irrespective of their social and financial background. The university established an endowment fund in 2014 to cater for its disadvantaged students who needed support to successfully complete their studies. World over, the practice in universities is that endowment funds are established to cater for the financial needs of gifted but needy students. This has seen world class universities like Harvard University and Oxford University attract some of the world's greatest minds.

At DeKUT our vision is to not only attract the great minds in the country and beyond but to also be able to retain them without the hindrance of financial constraints. That is why we are committed to every effort to raise awareness towards the endowment fund. The Annual Dedan Kimathi Charity Golf Tournament is one such initiative. The first tournament was held at the Nyeri Golf Club on 20th February 2016. The event was a success, attracting over 100 golf enthusiasts and sponsors from across the country. Staff and students also came in large numbers to play and to show support. With several prizes up for grabs, golfers did their best to ensure they got a prize.

Among the golfers were our 2015 Honoris Causa recipient Dr. Muriithi Ndegwa and His wife Mrs. Ndegwa, renowned avid golfers and friends of the university. The couple came to support the university in its initiative. Dr. Ndegwa played quite an impressive game challenging the younger golfers in the crowd. So enticing was the game that our Vice chancellor, Prof. Ndirangu Kioni also played. He played quite an impressive game considering it was his first ever attempt giving hope to all the amateurs in the crowd who watched him as he played the last hole.

Our students were not left behind. They came in a large number to watch and interact with the golfers. Golfers could be spotted giving them advice from time to time along the golf course. They were encouraged to join the game and break the myth that golf was a rich man's game.

Among the sponsors were the Alumni Association of DeKUT, Family Bank and UAP-Old Mutual Group and individuals led by Dr. Ndegwa who contributed various amounts towards the endowment fund.

Plans for the 2017 golf Tournament are underway and we hope to attract an even bigger turnout of golfers and generous donations towards out endowment fund from the corporate world and well-wishers.



Dr. Ndegwa, Mrs. Ndegwa and prof. Kioni with staff and students pose for a photo on the course

INSTITUTE OF FOOD BIORESOURCES TECHNOLOGY

The Institute of Food Bioresources Technology was established to promote the appropriate technologies and value addition in food processing, which in turn increase the quality and safety of food. The Institute offers training in Food Science and Technology and on Coffee Technology courses.The Institute graduated its first group of 52 graduands in 2015. During the same year, the Institute produced the first PhD graduate in Food Science and Technology and one more during this graduation. The Institute currently has 4 PhD holders out of six academic staff and the fifth one (the second PhD in Food Science and Technology, DeKUT) is expected to graduate in April, 2016. More admission will be ongoing every year for the post graduate programmes. The Institute admitted its first group of post graduate students for MSc in Food science and technology in September, 2016 for the academic year of 2015/2016.



MSc. Students with one of our international student's during their coffee technology practical.

The Institute offers courses in coffee technology: Diploma in Coffee Technology and Cupping and Certificate in coffee Technology and Quality Management. The institute has graduated several students in coffee technology who have been absorbed into the coffee industry. The demand for the coffee experts is increasing as consumers become increasingly aware of coffee quality and the University through the Institute has taken the initiative as the only institution in Kenya to train in coffee technology.

The University through the Institute has entered into collaboration with several stake holders to help support the training. One of the organizations is Just Fair together with Othaya Coffee Cooperative Society which is sponsoring students for a certificate course. On graduating, they go back to work at the coffee processing factories well equipped to improve productivity in the value chain.The Institute has been playing an active role in Nyeri County through participation in the Coffee Sub sector Taskforce and the Agricultural Sector Development Support Program which aims at improving agricultural production.

In addition, the Institute through the University has established international collaboration with Technical University of Applied Science (TUAS) Germany on coffee technology research. This year one post graduate student visited the Institute for two months and undertook coffee research and plans are underway to send one staff from the Institute to TUAS to undertake complete research for Master's thesis. The institute also received an international student through the exchange program from Scotland. This helps students interact and share ideas to promote education, culture and to network. One of the international students participated in the recent climb to educate initiative by joining others in climbing Mount Kenya.

Apart from the academic programs the Institute offers consultancy and extension services to farmers within the county as well as offer short courses. Dedan Kimathi University of Technology has fully equipped modern coffee cupping laboratory that was developed through collaboration with African Wildlife Foundation and Starbucks limited, a leading organization in specialty coffee. The laboratory was established to serve the coffee sector through value addition, consultancy and extension services. The laboratory liquorers are certified by the coffee Board of Kenya, currently Coffee Directorate. The Institute has two qualified cuppers who offer advisory services to farmers on coffee quality, train on coffee technology and cupping in addition to offering short courses for the coffee sector

The Institute undertakes value addition activities by processing and packaging the coffee. The DeKUT premium brand is one of the highest quality coffee product in the market. It is obtained from processing the high quality grade green coffee beans. The brand qualified for the "Coffee Kenya" mark of identity that identifies Kenyan coffee globally. The University has acquired a "Coffee Grower and Marketer license." In line with vision 2030, the Institute focuses on education and research, industry linkages, and consultancy and technology transfer.



DeKUT Premium coffee

EDIBLE INSECTS AS SOURCES OF NUTRITION AND A DELICACY FOOD IN KENYA

By Martin Kanja Muiruri; Finalist, BSc Food Science and Technology, Institute of Food Bioresources and Technology (IFBT), DeKUT.

Consumption of edible insects has a long history among many cultures in Kenya. Edible insects have played a role as being part of human nutrition in many regions around the world such as Africa,Asia and Latin America as well. There are more than one thousand insect species edible at some stages in their life cycle. The edible insects are traditional foods for humans representing important parts of the nutritious intake and economic resources of many societies. Some of the edible insects with nutritive value include crickets, grasshoppers, hemiperans, homopterans and lepidopterans.

Many people in rural areas in Africa suffer from under nutrition, especially protein energy malnutrition (PEM), thus alternative nutritional food sources are needed. In Kenya , the communities affected include those residing in the arid and semi-aridareas , including Wajir, Mandera, Garissa, Samburu and Turkana counties amongst others. The social cultural and economic limitations often impede the use of more common protein sources such as pork, beef and poultry. While the western nations have reluctance to consume insects, probably more than half of the world's people regularly eat them and they contribute significantly to their protein intake.

Over the recent decades, edible insects have been used in value added products such as baby foods, canned foods and even snacks on a commercial scale.Traditionally, edible insects were collected from paddy fields, upland and forested areas, ponds and streams, some are available all year round.

Edible insects represents the cheapest source of animal protein, their consumption should be encouraged because many people cannot afford fish or other meat. There is however a caution due to the caloric deficiency in the diet of these people as protein cannot be fully utilized if there is not enough energy in the meals. The protein content of edible insects ranges from 38%-64% , an indication that the insects can be of value in human and animal rations , thus replacing more costly sources of animal protein that are usually absent in the diet of rural dwellers in developing countries as Kenya. Beside the high amounts of protein that insects can provide, some species have demonstrated their high quality and high digestibility. The quality of the protein, and thus its nutritional value, is determined by the amino acid composition and the digestibility of the protein.

Insects offer significant advantages in food production, especially when compared with traditional livestock production. There is considerable potential in widening the market for edible insects by incorporating insect protein in supplements, processed foods and animal feeds. Edible insects are increasingly being farmed in the western region of Kenya, expanding an industry that has sprung since late 90's. In instances where insects are traditional foods among a certain group, this fact can serve as a path to commercial development. Insects are traditional foods in many cultures and play an important role in human nutrition. The insect has been a good nutritional food source, especially for fat and protein. Many insects are herbivorous and less problematic than omnivores as far as toxicity and food safety of the micro livestock's are concerned.

The Kenyan edible insects reflect rich cultural traditions and a diverse biological resource. If well exploited, the entomophagy field can offer good resource for generating income, likely to increase rearing of more of the edible insects. Forest fragmentation and habitat loss are increasing because of land development. The effect would be extinction, leading to a decrease in insect diversity as well as population of other native fauna and flora. Kenyan entomologists, as well as locals, have developed techniques for mass rearing on a commercial scale for several edible insects' species such as crickets, silk worms, ants and bamboo caterpillars. When the insects are used in a suitable manner, appropriate commercial use will be propelled by people's awareness of the insects' habitats and related factors.



THE BIRDS' PARADISE THAT IS DeKUT's ECOSYSTEM

By David Muchiri
DeKUT Conservancy Coordinator

Dedan Kimathi University of Technology (Dekut) is a home to over 200 avifauna bird species. The location of human habitation, inland water and coffee farm adds value to the species' richness and diversity. Some of the species are threatened with extinction, for example the Hinde's babbler, Paleartic migrants, Black cap and Birds of Cultural value and Hartlaub's turaco, among others. There are various nesting and breeding sites within the ecological habitats. This allows adequate survey of the ecosystem and its product of birds' species. The diverse floral species offer a wide range of nesting habitats, food material and breeding sites. There also exist cliff sites for ground nesters e.g Cinnamon chested Bee -eater, dead tree stumps for Silvery Cheeked Hornbill and aquatic vegetation cover for Grosbeak weaver. The University is 1,796 m above sea level and is served by permanent rivers namely Njeng'u River to the North and Muringato River to the South. The all year supply of water has a rich riparian land with vegetation and hence a maintenance of species richness and abundance within the ecosystem.

The University Conservancy with an area of 140 acres is in an indigenous forest that offers an attractive site for birds; both residents and paleartic migrants. This has promoted the richness and species diversity within the University and its environs. There are the tree top nesters remarkably the 'King of the Birds', Hamerkop and ground nesters like the Cape Robin-Chat amongst other species.

With more than 100 bird species, DeKUT offers a very rich biodiversity for ornithologists and other bird lovers. Some of the bird species at the University are:

Hartlaub's Turaco-Commonly found in the conservancy and on tall trees outside the conservancy.





Cinnamon chested Bee-eater-.Nests on cliffs in holes at the conservancy and DeKUT farm



Red Collared Widowbird- Breeding plumage of a male and commonly in open grassland and coffee farm



Variable Sunbird-Spotted in all the habitats of the University during the rainy season



Hadada Ibis- Found near water bodies e.g Oxygenation pond at DeKUT farm and Conservancy animals' water holes



Egyptian Geese- Found near water holes in the conservancy and oxygenation pond at DeKUT farm



Emerald Spotted Wood-dove-Found in the conservancy



Hamerkop- 'King of the birds'-Found in the conservancy



Cape Robin-Chat-In all DeKUT ecosystems



African Paradise Flycatcher-In the conservancy and edges of DeKUT coffee farm



Little Rock-Thrush-In all DeKUT Ecosystems

THE EVOLUTION OF HOSPITALITY INDUSTRY ACROSS SPACE AND TIME



By Ms. Peninah Chege
Assistant Lecturer; Institute of Sustainable Tourism and Hospitality, DeKUT

Hospitality is as old as mankind. In the early days of man's occupation of the earth, hospitality was primarily defined by the relationship between a guest and a host. In this case the host received and entertained the guest with goodwill. Hospitality was basically seen as the virtue of a great soul that cares for the whole universe through the ties of humanity. Hospitality was held in high regard and was a measure of nobility and social standing. It formed the foundation of human ethos of graciousness towards guests.

Over time, hospitality has evolved and metamorphosed in different forms and facets. It is no longer about the personal giving of the host's own food and accommodation but a matter of interpersonal financial exchange. It has grown to be a driver of socio-economic development for many countries in the modern world. A number of researchers have argued that commercial hospitality provision arose from the general process of modernization and the collapse of the virtue of kinship and social duty of care. Despite this fanciful view being shared by many scholars, the genesis of the commercial hospitality industry remains somewhat a conundrum.

Establishment of early hospitality facilities stemmed from an array of diverse factors. Hospitality facilities have donned different architectural designs. The first formal hospitality establishment is the Nisiyama Onsen Keiunkan in Yamanashi, Japan. Records have shown that the facility was commissioned at about 705 AD. To put this into perspective, it means the hotel was established a whopping 1,083 years before the American constitution was promulgated. In another dialect, the facility was established about 1258 years before Kenya became a republic. The growth and spread of trade and civilization opened up the need for establishment of hotels around the world to cater for the needs of early travellers and explorers. As such, Zum Roten Baeren was opened in Freiburg, Germany at about 1120 AD. This is the oldest hotel in Europe and is believed to be older than the town in which it is located.

Africa, being the cradle of mankind attracted many explorers and missionaries. This created the need for establishment of hospitality facilities. In Ethiopia, Taitu hotel was established in 1907 by Empress Taitu. Later on other facilities were established in Africa such as Saint Georges, in Algeria. Saint Georges has been described as "a piece of heaven in the middle of a hectic city"

In Kenya the conditions for establishment of hotels ripened in 1895, when Kenya became a British protectorate. With that colonial status, many European continued to flock in Kenya. Coupled with the construction of the Kenya-Uganda Railway, the onset of civilization in Kenya had taken a major leap forward. The Norfolk was therefore established in 1904, and became a famous meeting point for all new arrivals. The hotel that started as nothing more than a few ramshackle bungalows metamorphosed into one of the world's best hotels.

With development of technology and new innovations, hotels software and hardware has metamorphosed in space and time. Recently the tallest hotel, JW Marriott Marquis was opened in Dubai. The Residence Tunis in Tunisia, is one of the facilities that has adopted eco-innovation, through installation of an Energy-Efficient Trigeneration Plant system. It is a leading hospitality facility in adoption of sustainable development pathways. The Manta Resort on the Zanzibar island of Pemba is the first underwater hotel room in Africa and the second in the globe.

Hospitality has many benefits. Among many others, it is a major source of foreign exchange for Kenya. Hospitality therefore has a significant role in driving Kenya towards attainment of vision 2030. Despite the significance of hospitality to social-economic development pillar for Kenya, the sector is not without challenges. The challenges range from terrorism threats, climate change, changing market and technological trends. In view of the changing market and technological trends, there is need to constantly equip hospitality human resource with the most appropriate skills and latest technological information. Without training, sustainability of the industry will be in jeopardy.

Dedan Kimathi University, through the Institute of Sustainable Tourism and Hospitality, has come in to fill the skills and technological lacuna constantly created by a highly dynamic hospitality industry. The University has succeeded in many ways to the rejuvenation of the Hospitality industry in Kenya. Many Kenyans have trained in hospitality and tourism at the Institute. The university has established a conservancy, conference facilities, a guest house with laundry, Cottages, VIP Tents and a coffee shop. The facilities offer practical training opportunities to the students in particular and Kenyans in general. This is testimony that, the Institute of Sustainable Tourism and Hospitality management at Dedan Kimathi University of technology is achieving the objectives for which it was established and the university is playing a key role towards the achievement of vision 2030.

BACHELOR IN SUSTAINABLE TOURISM AND HOSPITALITY MANAGEMENT PROGRAMME AT DeKUT

The tourism and hospitality industry is among the fastest expanding industries in the world and an important top foreign exchange earner for Kenya. Kenya is endowed with rich fauna and flora biodiversity characterized by a myriad of terrestrial and marine plant and wildlife, natural and physical scenic features, and a growing diversity in the social-cultural heritage of the people. To date conventional tourism has dominated the tourism sector in the region. However, the demand on land for agricultural use and other development activities is rising threatening the future sustainability of tourism resources.

The new tourism policy has put emphasis on involvement of the local communities in managing tourism resources. The Government is determined to encourage and facilitate this approach. To achieve this, the emphasis must be directed to sustainable tourism development as the core in this industry supported by expansion in the hospitality service sector. There is inadequate skilled manpower in this sector but the future of tourism needs product diversification, opening up of new tourist circuits, promotion of domestic tourism and provision of skilled manpower. The programme in Sustainable Tourism and Hospitality Management is designed to train manpower to meet these challenges.

The bachelors degree in Sustainable Tourism and Hospitality Management offers opportunities for diversification in tourism and has the potential to transform Kenyan economy and conserve the environment and culture. This can be realised through increased involvement of all stakeholders in decision making and sharing of benefits. In order to actualize the above positive attributes, an expanded hospitality service network should be established. The degree programme in Sustainable Tourism and Hospitality Management will provide competence to service providers in this industry by training new entrants or upgrading skills of those who are already in the industry.

Tourism is a complex industry governed by the laws of supply and demand. The modern time tourist, especially ecotourist, demand more information and guidance on the tourism product's natural history than the amateur naturalist, who is sufficiently rewarded if he/she can see a great eagle soar across the sky or come upon a pride of lions resting in a thorn bush. The programme will provide the competence needed to take the client to the next stage beyond identification i.e. to appreciate the ecology, behavior and the tourism product's interrelationship with the environment.

This programme is housed in the Institute of Tourism and Hospitality Management (IToHM) whose Director is Prof. Fred K. Waweru who has spearheaded the growth of the institute to comprise of the academic section, conservancy and a tourism business component. Apart from the degree programme, the institute offers diploma in sustainable tourism and hospitality management to ensure equitable access to education especially for those who do not meet the minimum qualification for the degree programme. The diploma students are eligible to joining the degree programme upon successful completion of their course. The institute has so far graduated its first cohort of graduates and is graduating the second during this 4th graduation ceremony

The university endeavors to produce quality graduates in line with its vision. To this end, the university has set aside a laboratory for hospitality practicals where students get hands on experience to enable them polish their skills in the chancellor's Guest house and cottages located in the conservancy.

The DeKUT conservancy, which makes Dedan Kimathi University of Technology the only university with a conservancy in Kenya, boasts of rich species of flora and fauna. This has also contributed immensely in enhancing skills of the students since they can learn more about the flora and fauna. The conservancy also has a conference facility that can accommodate up to 300pax which has been very instrumental for hosting meetings for the university as well as those from outside. This therefore has gone a long way to enhance learning for the students



Zebras at DeKUT conservancy



Animals grazing at DeKUT Conservancy



Ilamas at DeKUT Conservancy



IToHM students at Mombasa Marine park being addressed by the Warden

Regular field trips give a fulfilling experience to say the least. Apart from reinforcing the knowledge acquired from the class, it gives students a different experience and set up where they can learn more from the industry itself. DeKUT organizes academic field trips every semester in relation to the units being taught so that students can get hands on experience from other organizations and facilities which may not be available in the university.

The university has good relationship with the industry players thus enabling it secure academic field trips, attachments and internships for its graduates. Most of our graduates in Sustainable Tourism and Hospitality Management get jobs on completion, a good reason why students should enroll for a career in tourism and hospitality management at DeKUT.

"The tourism and hospitality industry is among the fastest expanding industries in the world"



4th year students at Mida Creek studying the Mangrove forest

RISK MANAGEMENT PERSPECTIVE IN ORGANISATIONS **BUSSINESS PROCESSSES.**

Risk management has gained emphasis due to its capacity in providing good foundation for institutional management in addition to the traditional functions which are: results focus, coordination, legislation, funding and resource allocation, promotion, monitoring and evaluation, research development and knowledge transfer. However, risk management which produces interventions in all the other functions seems not to have been well conceptualized by many managers in organizations. Training sessions have also not adequately addressed this gap since sometimes they are done in short sessions due to limitation of available resources and competing needs of institutions. However it is imperative that all members of institutions be well versed with Risk management skills for it is very instrumental in achieving the objectives of an institution.

It is in this regard that I wish to bring to light how Risk management operates in a business process and demulsify it since it's not a function of exposing weaknesses in an institution as perceived by many but of achieving efficiency. I will use a simple and common example at a granular level to illustrate the principles used in risk management.

Think of a human resource department that each organization must have for paying employees salary. A human resource manager is employed to take charge of all the activities in this area and thus becomes the process owner. The process ordinarily involves managing employee expense claims, their payments, processing and recording. To be able to achieve this, the process owner will ordinarily have to assess the organizations objective, the critical process to achieve this, the risks, controls, assessment analysis of the risks, evaluation of the risks and actions to take.

Let's examine what is required in each process so that we can appreciate the role of risk management:

Step1: The business objective

The objectives of this process are to:

1. Keep employees happy
2. Meet contractual requirements (actual if contained in the employment contract and implied if contained in a HR policy)
3. Meet external compliance obligations such as Corporations Law and Tax Laws
4. Manage expenses

Step 2: Identify critical process

The critical processes (things we need to successfully complete in order to meet the objectives) are:

1. Pay the correct amount
2. Pay on time
3. Pay the correct bank account
4. Have a simple and fair expense policy and expense claim process
5. Know what the contractual obligations are
6. Meet the contractual obligations. Depending on what they are
7. Know what the external compliance obligations are. ie KRA laws, NSSF etc which require proper recording and accounting with adequate supporting documentation
8. Post to the correct general ledger account
9. Post the correct amount
10. Post in the correct period
11. Obtain and maintain relevant supporting documentation
12. Prepare and maintain a budget and assess budget vs. actual
13. Pay only legitimate expenses

I have listed the critical processes in order of the objectives. However, there is a many to many relationship between objectives and critical processes which means one critical process can meet more than one objective or vice versa.

Step 3: Risks

We can now ask ourselves – what risks exist that could prevent the critical processes from being successfully completed? It is best to address each critical process at a time to ensure all key risks are identified. Again, there is a many to many relationship between critical processes and risks. I have only listed risks relating to the first three critical processes as examples:

1. Manual processing error
2. System processing error
3. Third party bank processing error
4. System outage
5. Insufficient available funds

Step 4: Controls

For each risk, we then identify the key controls. Below are examples relating to some of the risks noted above?

1. Segregation of duties - Review and authorise
2. Reconciliation
3. Staff resource management
4. Back-up systems
5. Cash flow planning e.g. obtaining overdraft facility

Step 5: Assess and analyze the risks

We can now analyze the risks by assessing their likelihood and impact using the pre-determined scales. For example I will use a simple rating: 1 = Low, 2 = medium and 3 = high for likelihood and for impact I will use minor, medium and major).

Step 6: Evaluate

Evaluation of the risk is made against the organization's risk appetite, commonly using a risk matrix (likelihood x impact)

Step 7: Issues and Actions

The evaluation into risk levels (likelihood x impact) then prompts how the risk will be dealt with. Depending on the risk appetite levels, the response may be:

- Accept the risk. This would occur automatically if the risk was within the acceptable level or formally if it was outside of normal acceptance
- Reduce the risk by:
- Increasing controls
- Transferring some of the impact (e.g. Insurance)
- Avoiding by ceasing the process
- Process re-engineering to change the level of inherent risk
- Increasing the risk by:
- Removing or reducing controls because the cost does not outweigh the benefit
- Process re-engineering which increases the level of inherent risk based on increasing reward

This is the process that each process manager or even an individual should be able to evaluate in every activity and mitigate the risks as explained above. This process when done in this manner has the following advantages:

1. It aligns risk management perfectly with the organizations objectives and ultimate strategy
2. It helps embed risk management as part of the normal business process
3. It overcomes the view that risk management is opposed and works against the achievement of objectives
4. It is more engaging with the business as it focuses on the achievement of objectives

CPA James Njaria
Chief Internal auditor (Risk, Audit and Compliance)



Student Exchange: Ms. Vanessa Gering, a Bioinformatic/Biosystems Engineering student from the Technical University of Applied Sciences (TUAS) in Wildau conducting research in the Microbiology Lab.



Student Exchange: DeKUT Students addressing their collegues at University of Rwanda, Busogo Campus

INTERNATIONALIZATION **ACTIVITIES AT DeKUT**



International visits: National Tsing Hua University Students on a tour to DeKUT on 16th July, 2015



Staff Exchange: Prof. Muchiri giving a lecturer to Engineering students at the Technical University of Wildau, Germany.



International Collaboration: A visit to Korea National Police University CCTV Surveillance Room by the VC and Criminology Department Staff. The visit culminated in the signing of an MoU between the two universities.



Staff Exchange: Three staff from the School of Engineering who participated in a research exchange visit to Technical University of Applied Sciences, Wildau Germany.

ACTUARIAL SCIENCE IN DeKUT



First year Students being registered during orientation week

What is Actuarial Science?
This is the discipline that applies mathematical and statistical methods to assess risk in insurance, finance and other industries and professions. Actuaries are professionals who are qualified in this field through intense education and experience. In many countries, actuaries must demonstrate their competence by passing a series of thorough professional examinations.

Why Actuarial Science?
Are you interested in money and investing it? Do you enjoy mathematics, and find statistics fascinating? If so, working as an actuary could be possible career option. Actuaries are experts who design products like these to look after people's financial needs and to protect their financial interests: part of their work is to try to predict what money will do when it is invested. The Government, companies and individuals spends billions of shillings each year on financial products such as insurance, pensions and mortgages.

Actuaries help individuals and businesses to make financial sense of the future. They help to safeguard future financial well-being in an ever-challenging world. Actuaries require a high degree of numerical literacy, are trained in mathematics, probability and statistics.

Some career possibilities
By choosing an actuarial science degree you are not committing yourself to becoming an actuary. Many graduates do become actuarial trainees but others go on to a variety of financial and other careers including insurance, accountancy training, finance companies, banking or research for higher degrees.

To qualify as an actuary you need a good honours degree in Actuarial Science (or a subject with a high numerical content such as Mathematics, Statistics or Economics) and specialist professional qualifications from the Faculty and Institute of Actuaries. Many students come to the profession from backgrounds in Mathematics, Statistics, finance, economics and other areas. However, potential actuaries all seem to have a couple of key things in common an interest in, and an aptitude for, Mathematics and a desire to put Mathematical skills to use in a business context

The actuarial profession is perfect for individuals who enjoy challenges and problems solving. Those who develop a track-record of success will have many opportunities for growth and advancement. Most employers of actuaries' award merit increases as you gain experience and pass the actuarial examinations. Most companies also offer cash bonuses, salary increases, and promotions for each professional designation achieved.

Skills acquired by actuaries, especially the quantitative analysis of risk, are valued in the marketplace. As such, those who have the will to succeed can aspire to career advancement with an actuarial credential.

While many actuaries work in the insurance industry, the actuarial skill set is being increasingly sought after by industries that have not traditionally employed actuaries. These areas include the financial services industry, marketing/ sales organizations, and benefits management firms, among many others

Problem solving, critical thinking, and more

Ask ten actuaries why they chose to become an actuary, and you will get ten different answers, but one theme will emerge from every response: Smart Work. Actuarial work is interdisciplinary at its core. Practicing actuaries draw upon mathematics, statistics, economics, finance, risk management, computer science, and much more to solve problems from how much insurance costs to complicated investment hedging.

Actuaries earn professional credentials by passing a series of examinations. Preparation is key, there is no shortcut to success in the exam process. It takes a lot of hard work, dedication and motivation to get through the many hours of independent study that are required to prepare for each exam. While everyone studies differently, the typical candidate studies about 100 hours for every hour of the exam. For example, exam P/1 is a three hour exam. That means you will be hitting the books for 300 hours to fully master the concepts tested on that exam

Where Actuaries work?

Actuaries' work anywhere risk is present.

The insurance industry can't function without actuaries. We calculate their costs and determine the premiums for policyholders; and while we don't forecast the weather, we can tell them how much they can expect to pay in claims after the next catastrophic event.

Private corporations rely on our risk evaluation to frame their strategic management decisions. And because our judgment is highly valued, our career paths often lead to upper management and executive positions.

Actuaries are also employed as consultants. Whether they are a part of a nationwide firm or an independent one-person practice, they help companies design pension and benefit plans, evaluate assets and liabilities, and stare down risk–all alongside top executives.

Actuaries work for the government too, helping manage its programs and overseeing public companies to ensure compliance with regulatory laws.

We also work for:

- Colleges and universities
- Banks and investment firms
- Public accounting firms
- Labor unions
- Rating bureaus
- Fraternal organizations

The Department of Statistics and Actuarial Science in DeKUT serves the University and the discipline of Statistics and Actuarial Science through the interrelated functions of teaching, consultation and research. This department is among the top academic units for Statistical and Actuarial Science in the county and is home to an active full-time team working in diverse and exciting areas including; as Inferential Theory, Survey Theory, and Experimental Designs to Applied Statistics areas such as Operations Research, Econometrics, Financial Time Series Analysis, and Financial Risk Management. The Department is also home to over 300 undergraduate students in the Actuarial Science course.

Why you must recommend Actuarial Science degree at Dedan Kimathi University of Technology

- Quality education
- Dedicated staff
- Good learning environment
- Quality graduates that are highly valued in the industry; some of our graduates work with the following State corporations and companies among others; KRA, BRITAM, IRA, Kenya RE, ICEA-Lion, Jubilee Insurance, UAP insurance, APA

Some of Our Achievements

The Insurance Regulatory Authority (IRA), a state corporation with the mandate to supervise, regulate and develop the insurance industry in Kenya offers five (5) scholarships to Kenyans interested in pursuing Actuarial Science courses at the Cass Business School, United Kingdom. The **Scholarship is for Master of Science Degree in Actuarial Management / Science.** Dedan Kimathi University of Technology students have won the IRA scholarships to Cass Business School in London for the last three years in a row:

2015: KITHAKA Mutegi
Graduated with 2nd Class Honours Upper Division in 2012

2014: MWANGI Wakonyo Lyndah
graduated with 1st class in 2012

2013: MUTISYA Muli John
graduated with 1st class in 2011

In November last year one of our former students Kevin Okemwa was No. 1 in an aptitude test administered to 201 students shortlisted for employment in NCA. He is now employed there as a manager in the research section.

ALL ABOUT MOUNTAIN SICKNESS (Altitude sickness)



Dr. Macharia
DeKUT Medical Center

Acute mountain sickness (AMS) is actually more common in fit young men because they are more likely to attempt a rapid ascent by racing up the mountain. As a general rule, it is far safer to avoid altitude sickness by planning gradual climb to acclimatize to altitude as you ascend, (you can race back down as fast as you like!).

The Causes of Altitude Sickness

As altitude increases, the percentage of oxygen remains the same but the number of oxygen molecules per breath is reduced thus the body must adjust to having less oxygen.

In addition, high altitude and lower air pressure causes fluid to leak from the capillaries in both the lungs and the brain which can lead to fluid build-up. This can cause a life-threatening altitude sickness.

Acclimatization

The main cause of altitude sickness is going too high too quickly. Given enough time, your body will adapt to the decrease in oxygen at a specific altitude.

Several changes take place in the body which enables it to cope with decreased oxygen (acclimatization):

- The depth of respiration increases.
- The body produces more red blood cells to carry oxygen.
- Pressure in pulmonary capillaries is increased, "forcing" blood into parts of the lung which are not normally used when breathing at sea level.
- The body produces more of a particular enzyme that causes the release of oxygen from hemoglobin to the body tissues.

Acute Mountain Sickness (AMS)

AMS is very common at high altitude. The occurrence of AMS is dependent upon the elevation, the rate of ascent, and individual susceptibility. Many people will experience mild AMS during the acclimatization process. The symptoms of Mild AMS include:

- Headache
- Nausea & Dizziness
- Loss of appetite
- Fatigue
- Shortness of breath
- Disturbed sleep
- General feeling of malaise

Symptoms tend to be worse at night and when respiratory drive is decreased. As long as symptoms are mild, ascent can continue

at a moderate rate. It is essential that you communicate any symptoms of illness immediately to others on your trip.
Moderate AMS

The signs and symptoms of Moderate AMS include:-

- Severe headache that is not relieved by medication
- Nausea and vomiting, increasing weakness and fatigue
- Shortness of breath
- Decreased co-ordination (ataxia)

Severe AMS

There are two serious conditions associated with severe altitude sickness; High Altitude Cerebral Oedema (HACO) and High Altitude Pulmonary Oedema (HAPO).

High Altitude Pulmonary Oedema (HAPO)

HAPO results from fluid buildup in the lungs. This fluid prevents effective oxygen exchange. As the condition becomes more severe, the level of oxygen in the bloodstream decreases, which leads to cyanosis, impaired cerebral function, and death.
Symptoms of HAPO include:-

- Shortness of breath at rest
- Tightness in the chest, and a persistent cough bringing up white, watery, or frothy fluid
- Marked fatigue and weakness
- A feeling of impending suffocation at night
- Confusion, and irrational behavior

High Altitude Cerebral Oedema (HACO)

HACO is the result of the swelling of brain tissue from fluid leakage.

Symptoms of HACO include:-

- Headache
- Weakness
- Disorientation
- Loss of co-ordination
- Decreasing levels of consciousness
- Loss of memory
- Hallucinations & Psychotic behavior
- Coma.

Prevention of Altitude Sickness

- If you begin to show symptoms of moderate altitude sickness, don't go higher until symptoms decrease.
- If symptoms increase, go down, down, down!
- Stay properly hydrated. Acclimatization is often accompanied by fluid loss, so you need to drink lots of fluids to remain properly hydrated (at least four to six liters per day). Urine output should be copious and clear to pale yellow.
- Take it easy and don't overexert
- Avoid tobacco, alcohol and other depressant drugs
- Eat a high calorie diet while at altitude

"The main cause of altitude sickness is going too high too quickly"

Child of a Lesser God



Long hours he works at the mine,
Hopeful to make a decent dime,
Not all days are dull nor are they fine,
He toils hard because he has no time.

She digs under the scorching sun,
No rest no time to cool off from the farm,
Day in day out no excuse to have fun,
Hopeful that her rest is soon to come.

Both souls hustling to survive,
In a land that happiness has a place,
Yet not for them it cannot thrive,
Since they are the less fortunate case.

How come they never catch a break?
Why are their fates so cold and plain?
They ask isn't their maker awake?
Can't it be that their tears aren't in vain?

Are they sons of pure normal fate,
Or they belong to a maybe lesser god,
If only something could change their state,
Relieve them from this unfortunate load.

Being who they are is not easy,
For they may give up but not for long,
Always working hard keeping busy,
For their hearty dreams keeps them strong.

Pray, that a star changes this fate,
That good will does come through for their state.

By Cherotich Misoy
Feature photo by Mukiri Gitiri.
The Poet is a graduate from School of Business at Dedan Kimathi University of Technology.
Member of BAKE - DeKUT

ACADEMIC PROGRAMMES

SCHOOL OF ENGINEERING

- Msc. in Advanced manufacturing & Automation Engineering
- Msc in Industrial Engineering and Management
- Bachelor of Science in Electrical and Electronic Engineering
- Bachelor of Science in Mechatronic Engineering
- Bachelor of Science in Mechanical Engineering
- Bachelor of Science in Civil Engineering

SCHOOL OF SCIENCES

- Bachelor of Science Actuarial Sciences
- Bachelor of Science in Industrial Chemistry
- Bachelor of Science in Leather Technology
- Bridging Mathematics, chemistry and physics

SCHOOL OF BUSINESS MANAGEMENT AND ECONOMICS

- PhD in Business Administration and Management
- Master of Business Administration (MBA)
- Master of science in supply chain management
- Master of Science in Economics (Msc. Econ)
- Bachelor of Science in Criminology & Security Management
- Bachelor of Commerce (BCOM)
- Bachelor of Business Administration (BBA)
- Bachelor of Purchasing and Supplies Management (BPSM)
- Diploma in Business Administration (DBA)
- Diploma in Purchasing and Supplies Management
- Certificate in County Governance

INSTITUTE OF GEOMATICS, GIS& REMOTE SENSING (IGGRS)

- Master of Science in Geospatial Information Systems and Remote Sensing
- Bachelor of Science in Geomatics and Geospatial Information Systems
- Bachelor of Science in Geospatial Information Science and Remote Sensing

GEOTHERMAL ENERGY TRAINING & RESEARCH INSTITUTE (GETRI)

- Masters in Geothermal Technology
- Postgraduate Diploma in Geothermal & Energy Technology

SCHOOL OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

- Bachelor of Science in Computer Science
- Bachelor of Business Information Technology (BBIT)
- Bachelor of Science in Information Technology (Stage I)
- Bachelor of Science in Information Technology (Stage II)
- Diploma in Information Technology
- Certificate in Information Technology

SCHOOL OF HEALTH SCIENCE

- Bachelor of Science in Nursing- (Direct entry)
- Bachelor of Science in Nursing-(upgrading)

INSTITUTE OF FOOD AND BIORESOURCES TECHNOLOGY

- Bachelor of Science in Food Science Technology
- Diploma in food science technology
- Diploma in Coffee Technology and Cupping
- Certificate in Coffee Technology and Quality Management

INSTITUTE OF TOURISM AND HOSPITALITY MANAGEMENT

- Bachelor of Science in Sustainable Tourism and
- Hospitality Management
- Diploma in Sustainable Tourism and Hospitality Management
  Certificate in German Language

INSTITUTE OF TECHNICAL AND PROFESSIONAL STUDIES

- Bachelor of Education in Technology (Civil Engineering)
- Bachelor of Education in Technology (Electrical & Electronic Engineering)
- Bachelor of Education in Technology (Mechanical Engineering)
- ATC Level I & II
- CPA Sec. I-VI
- CCNA I, II, III, IV
- IT Essentials
- Diploma in Clothing and Fashion Design
- Diploma in Furniture Technology and Interior Design
- Diploma in Building Technology
- Diploma in Metal work, Welding and Design
- Certificate in Clothing and Fashion Design
- Certificate in Furniture Technology and Interior Design
- Certificate in Building Technology.
- Certificate in Metal work ,Welding and design

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