

NEWSLETTER

Issue 4: October 2020 - June 2021



Image source: IMF EAC 2016 report

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THE NELSON MANDELA AFRICAN INSTITUTE OF SCIENCE AND TECHNOLOGY

Academia for Society & Industry



CENIT@EA 6th JOINT STEERING COMMITTEE (JSC)

15th October 2020, Online Meeting

CENIT@EA held its sixth JSC meeting to discuss the progress of the centre, financial and communication strategy, students matters and future activities. Among deliberations of the meetings included:



DIGITAL SKILLS ACCELERATOR EVENTS

Digital skills accelerator is a CENIT@EA initiative aimed at imparting industry relevant skills and competencies among individuals in the EAC nations. The initiative funds different professional training opportunities. In this period, two sessions were funded, and a total of 50 individuals participated.

Android & Mobile Application Training, 15th October - Tanzania & Burundi, 26th Nov. 2020 - Rwanda & Uganda

A total of 50 unemployed graduates from Tanzania and Burundi participated in the training where some participants joined virtually at the Nelson Mandela African Institution of Science and Technology. Equally in Rwanda and Uganda, 50 unemployed graduates participated in the second organized digital skills event.



CAPACITY BUILDING ACTIVITIES

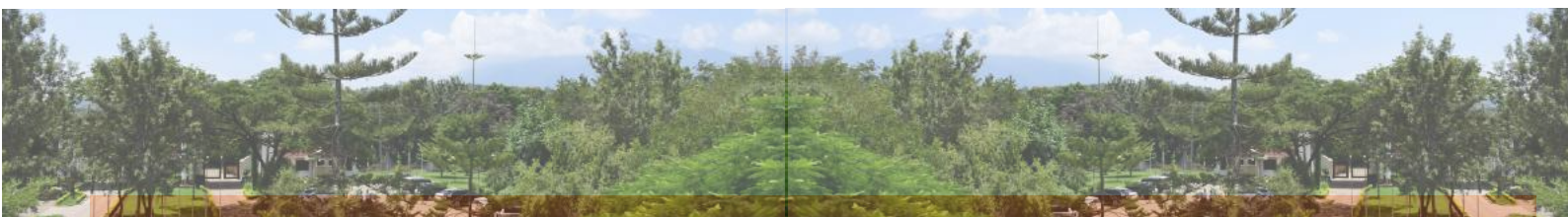
CENIT@EA Summer School 02nd - 07th Nov. 2020, NM-AIST

CENIT@EA organized a six days summer school sessions facilitated by True Maisha Company. The summer schools involved two parallel sessions on: Leadership and Change Management, and Social Innovation through Social Entrepreneurship. The training also involved site seeing for Internet of things (IoT) Trap development at Ngorongoro Conservation Area. The training involved 50 participants from NM-AIST, The Open University of Tanzania (OUT), Muhimbili University of Allied Science (MUHAS), University of Dar es Salaam (UDSM), Oxfam GB and Tanzania Agricultural Research Institute (TARI).



YouLead Summit 25th Nov. 2020, EAC Secretariat, Arusha

CENIT@EA Young Professionals participated in the YouLead Summit at East African Community (EAC). The summit aimed at informing youth on opportunities for digital innovation and solution for digital transformation of industries in EAC. Participants had the opportunity to present on digital skills and innovation in their areas of work and studies. Equally, students had an opportunity to share their experiences during company internships as part of the EMoS Master's program.



CAPACITY BUILDING ACTIVITIES

Innovation Promotion Training 14th - 18th Dec. 2020, NM-AIST

CENIT@EA organized a 5 days innovation promotion training held at NM-AIST and facilitated by Sahara Ventures. The training aimed at stimulating lecturers to promote innovation to their students and manage the overall innovation process so as to have a successful innovation.



Entrepreneurship Training 25th - 29th Jan 2021, NM-AIST

CENIT@EA organized a 5 days entrepreneurship training held at NM-AIST and facilitated by True Maisha Company. The training included 30 participants, selected from NM-AIST, University of Dar es Salaam, University of Nairobi and Institute of Accountancy Arusha.



Data Science Online Training 08th - 26th Feb. 2021,

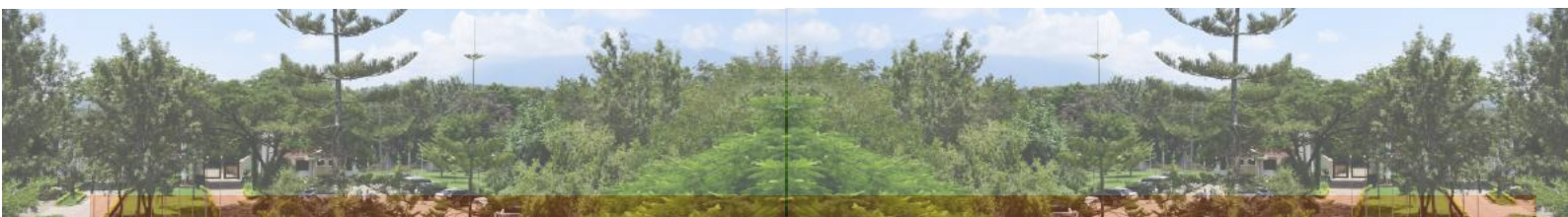
CENIT@EA supported 5 NM-AIST CoCSE faculty members to attend a virtual Train the Trainer workshop in Data Science organized by IBM. The training aimed at equipping participants with skills on data science concepts, technologies and use cases. The trainers are then expected to use this knowledge to enrich their teaching experiences and transfer the compounded knowledge to students.



CENIT@EA 3rd COHORT STUDENTS

15th January 2021, NM-AIST

NM-AIST welcomed 30 new students 3rd cohort intake for EMoS Master's programme. These students are CENIT@EA scholarship beneficiaries. All 6 EAC nations are well represented in this cohort with 43:57 female to male ratio.



CAPACITY BUILDING ACTIVITIES

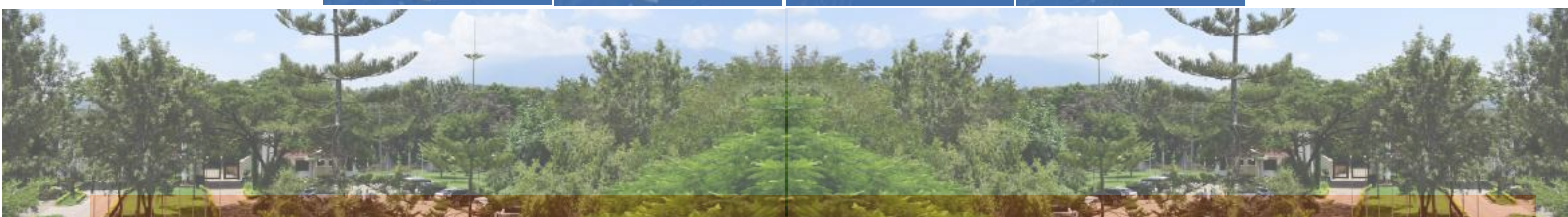
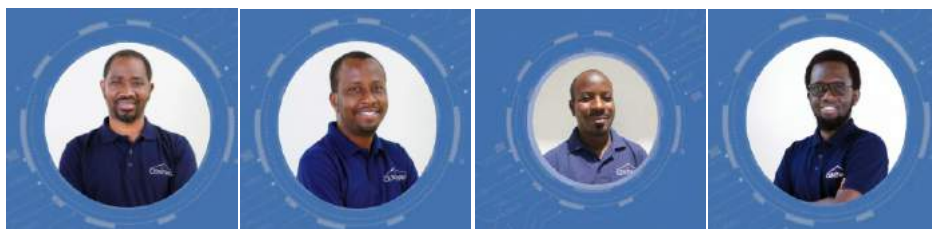
Embedded Systems Online Guest Lecture 24th Dec. Feb. 2021

CENIT@EA organized an online guest lecture on Embedded System with Zipline company. The session aimed at equipping EMOs students with knowledge on embedded software reliability and applications in a real world. The guest speaker was Mr. Lieven Leroy, Embedded Flight Systems Lead at Zipline and expert in Embedded Software Development and Engineering.



French Training Jan. - Mar. 2021, NM-AIST

CENIT@EA organized a 3 months French language training which was open to the NM-AIST staff and students. The training was conducted at NM-AIST. The facilitators for the training were four EMOs students from Burundi i.e., Mr. Salama Ndayisaba, Mr. Armel Bizoza, Mr. Deo Irankunda and Mr. Jesus Irakomeye. 50 participants registered for the training, 15 were able to complete.



ACADEMIA INDUSTRY COLLABORATION

Supervisory Visits for 1st Cohort Students in Industrial Placements Jan. - Feb. 2021

CENIT@EA in collaboration with GiZ team visited 1st cohort students who were attached to different companies/ institutions for outreach/ internships. Industrial placement is a good opportunity for students to get acquainted with different industries, learn professional ethics in practise and create meaning connections and solutions.



ACADEMIA INDUSTRY COLLABORATION

CENIT@EA & National Bank of Commerce (NBC) Meeting 28th Jan. 2021

In effort to forge Academia-Industry collaboration, to strengthen digital transformation initiatives in the EAC region, CENIT@EA and National Bank of Commerce (NBC) met with the aim of discussing opportunities for innovation transfer and knowledge exchange through outreach and internships opportunities for students, as well as well as collaboration in teaching, learning and research activities.



WOMEN AND GIRLS IN TECH

International Day of Women and Girls in Science
11th Feb. 2021

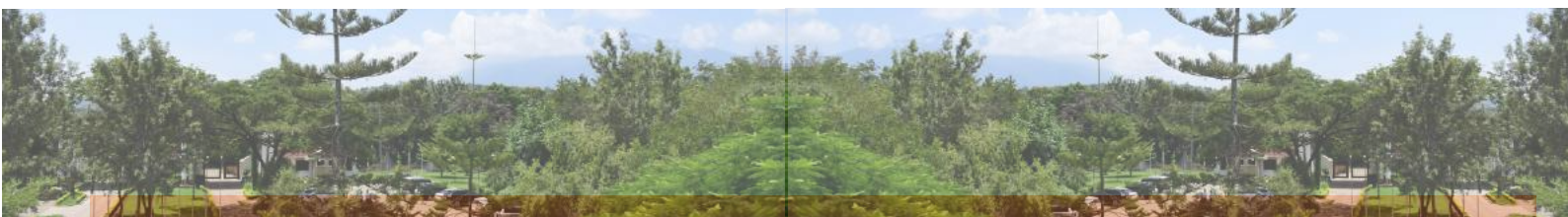
International Women's Day
08th Mar. 2021

Girls in ICT Day
23rd April 2021

CENIT@EA team celebrated international day of women and girls in Science and international women's day where students through social media platforms shared different quotes to encourage and motivate women and girls. Additionally, CENIT@EA in collaboration with GIZ team participated in celebrating International Girls in ICT Day where CENIT@EA students conducted an online event to encourage girls in ICT by sharing their journey in tech.



Women in STEM,
Enjoy What you do!



AWARDS & EVENTS

Mr. Thon Malek
April 2021.

CENIT@EA congratulates 2nd cohort student Mr. Thon Malek of South Sudan for winning a prestigious international award offered by the National Geographic Society, USA. Under the assistance of Dr. Judith Leo, Mr. Malek will implement a remote learning on the use of ICT applications for wild life conservation in South Sudan. CENIT@EA is all about addressing practical challenges at societal and industrial levels and for such initiatives, we celebrate the effort and challenge other students to be proactive in pursuing solutions to practical everyday challenges.



Recipient: Mr. Thon Malek
Theme: Remote learning on the use of ICT Applications for Wild Life Conservation in South Sudan
Awarding body: The National Geographic Society

Innovation Stories of East Africa, Regional Workshop 18th April 2021.

On celebrating innovation week in Tanzania, Digital Skills for an Innovative East African Industry (dSkills@EA) conducted a dialogue between innovation hubs in East Africa on the need to create a platform for collaboration and exchange of best practices. The event was virtually conducted and moderated by GiZ.





CENIT@EA

Centre of Excellence for ICT
in East Africa

OFFICIAL START - SECOND PHASE OF THE PROJECT

Project Name: Digital Skills for an Innovative East African Industry (dSkills@EA)

Official signing of dSkills@EA

17th May 2021, EAC Secretariat - Arusha

17th May 2021 marks the official start of the new project, Digital Skills for an Innovative East African Industry (dSkills@EA), after the successful signing of the agreement between Germany Ambassador - Tanzania, Regine Hess and the EAC Secretary General, Dr. Peter Mathuki.



Kick-off Meeting for dSkills@EA

19th May 2021, Arusha

The start of the new project included a kick-off meeting among partners of dSkills@EA. The meeting discussed the joint work plan and the respective partner roles in fulfilling the objectives of the project.



CENIT@EA 2ND COHORT GROUP PROJECTS

CENIT@EA curriculum incorporates group project assignments. These group project activities combine classroom knowledge, personal and group discussions in accomplishing a specified task. It is an opportunity for students to work on a problem/ challenge relevant to the society and/or industry. Students are expected to conduct literature review on the subject matter, formulate and implement solutions relevant to the subject matter. It is an opportunity to exercise team work and agree to disagree. Group projects are evaluated based on their relevance, methodological approach, team thinking and generally thinking outside the box to come up with meaningful solutions to everyday challenges. Within this newsletter period, 2nd cohort students worked on their group project, in among their research interest areas highlighted in figure below.



CENIT@EA 2ND COHORT GROUP PROJECTS

Smart Card Management System for Water Sale Based on RFID

Addressing the problem of water scarcity in low income communities, EMoS students developed a smart card management system based on RFID technology to deduct the amount of water dispensed from the user card.

Students: Rahab Uwamahoro, Aina Kipendaroho, Avith Habonimana and Frank Nyange
Supervisors: Dr. Neema Mduma and Dr. Mussa Ally



Web-mobile Students Information Management System a case of NM-AIST

On ensuring effective and efficient service delivery at the Nelson Mandela African Institution of Science and Technology (NM-AIST), EMoS students improved an existing student management information system to reduce workload and physical contact among users. The developed system generates customized reports and automate forward and backward communication.

Students: Thon Malek Garang, Angela Mseke, Happyness Chikusi, Stanley Manyonyi
Supervisors: Dr Shubi Kaijage and Dr. Edith Luhanga



CENIT@EA 2ND COHORT GROUP PROJECTS

NM-AIST E-Office - Traditional method of moving files from one office to another is hectic and it takes time. EMoS students developed an electronic management system to make the process easier for NM-AIST community.

Students: Yvonne Uwamahoro, Magdalena Bahati, Armel Bizoza, Alphonsina Shiyo
Supervisors: Dr. Dina Machuve and Dr. Neema Mduma



Mini Smart Library Direction System

Manual method of searching books in a library shelves is stressful and takes time, EMoS students developed a mini smart library direction system in order to make the process easier.

Students: Dominic Makjak Deng, Annette Mandari, Angerlo Bidal
Supervisors: Dr. Edith Luhanga and Dr. Neema Mosha



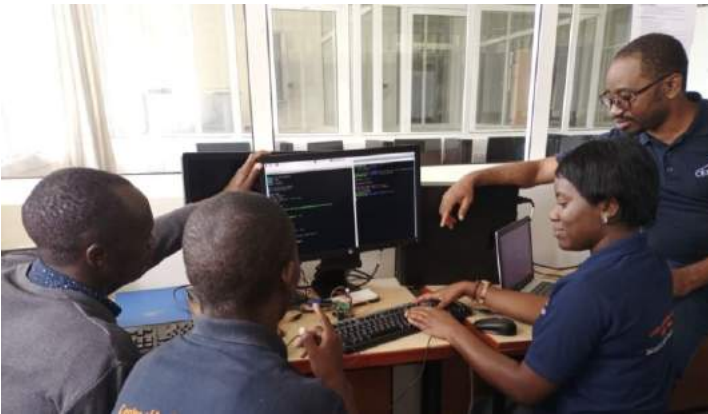
CENIT@EA 2ND COHORT GROUP PROJECTS

Smart Electronics Billboards

EMoS students developed a smart electronic billboard which displayed university announcements, seminars, awards and projects to improve communication approach at the Nelson Mandela African Institution of Science and Technology (NM-AIST) which mostly rely on emails and website.

Students: Yvonne Iradukunda, Innocent Ciza, Emmanuel Ronoh, Salama Ndayisaba

Supervisors: Dr. Kisangiri Michael and Dr. Devotha Nyambo

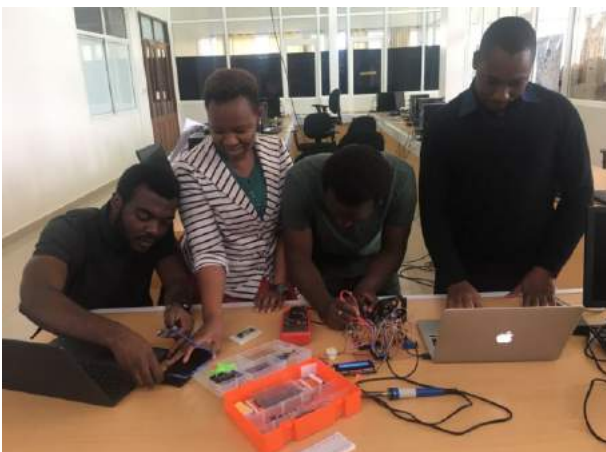


Comprehensive Security System based on IoT

EMoS students developed a security system to act as an early warning tool for preventing the industrial hazard outbreaks.

Students: Abel Nshimiye, Kisakyake Ng'ondya, Jesus de la Paix Irakomey, Elibariki Sumari

Supervisors: Dr. Anael Sam and Dr. Judith Leo

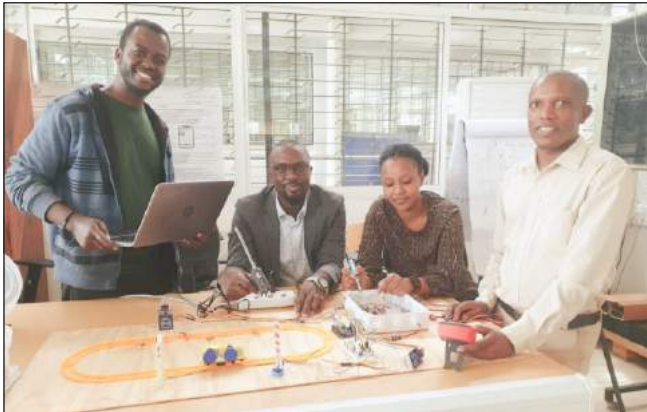


CENIT@EA 2ND COHORT GROUP PROJECTS

Designing of an Automatic Railway-Road Crossing System

Accidents are the major cause of death, EMoS students designed an automatic railway-road crossing system with a gate, traffic lights and siren in order to alert road users once the train is approaching..

Students: Christina Mariki, Gilbert Minja, Libere Nkuzimana, Zirakwiye Innocent
Supervisors: Dr. Mussa Ally and Dr. Neema Mduma



Smart Masai Cattle Grazing System

Who doesn't know how Maasai are very sensitive with their cattle? EMoS students developed smart cattle grazing system in order to monitor cattle and send timely updates to the herdsman.

Students: Lule Joseph, Zuhura Msisi
Supervisors: Dr. Shubi Kaijage and Dr. Ramadhani Sindi



CENIT@EA 2ND COHORT GROUP PROJECTS

Electrical Consumption Information in The Smart Houses

Electricity is the essential source of energy in our daily life. EMoS students developed an advanced technology of monitoring electric energy consumption of appliances in the household.

Students: Florian Rwegoshora, Hamis Msimbe, Daniel Wilson, Juma Salim
Supervisors: Dr. Ramadhani Sinde and Dr. Kisangiri Michael



Industrial Air Quality Monitoring System

Air pollution poses a major threat to health and climate. On addressing this problem, EMoS students developed a digital solution based on wireless sensor network to control air pollution in oil and gas industries.

Students: Mathiang Dut, Chantal Iribagiza, Kevin Iriho, Joseph Muriu Kiguta
Supervisors: Dr. Mussa Ally and Dr. Judith Leo



DISSEMINATION OF PROJECT WORK

Dissemination of project activities is very essential as it communicates with a wider audience. MSc. EMOs students actively participate in creating posters, presentation and papers as means to demonstrate and disseminate their work. 8 first cohort students disseminated their project findings in reputable journals. We commend their efforts and sensitize other students to get more involved in scientific writing and disseminate their projects activities and findings to a wider audience in order to educate and promote their developed/innovated concepts and processes.

CENIT@EA First Cohort Students' Published Papers

- 1 Mbandi, Josephine, and Michael Kisangari. "Data Collection Using Wireless Sensor Networks and Online Visualization for Kitui Kenya." African Handbook of Climate Change Adaptation (2020): p1-13.
- 2 Hilary, Rambo, Philemon Rotich, Anna Geofrey, and Sam Anael . "Early Fire Detection System in Tanzania Markets." In Engineering Proceedings, Vol. 2 (1) p. 50. Multidisciplinary Digital Publishing Institute, 2020.
- 3 Okello, Jimmy Obira, and Habibu Taban. "Design of Mobile Phone Charging Power Source Using Microwave Harvesting." Journal of Information Systems Engineering and Management Vol 5 (2) em0116.
- 4 Irankunda, Deo, Sinde Ramadhani, Mduma Neema, Dida Ally Mussa. "Development of the RFID Based Library Management and Anti-Theft System: A Case of East African Community (EAC) Region." International Journal of Advances in Scientific Research and Engineering (IJASRE) Vol 7(5) p49-59.
- 5 Katwale, Samwel, Ngollo Daudi, Amrani Hassan, Mduma Neema, Dida Ally Mussa, and Michael Kisangiri. "Development of a smart ugali cooker." International Journal of Advanced Technology and Engineering Exploration Vol 8 (75), p274
- 6 Manishimwe Alban, Alexander Happiness, Kaluuma Hillary, Dida Ally Mussa. "Intergrated Mobile Application Based on Machine Learning for East Africa Stock Market." Information Systems and Engineering and Management, Vol 6 (3), p 1-7.
- 7 Uwayisenga Ange Josiane, Mduma Neema and Dida Ally Mussa. "IoT-Based system for automated flood water detection and early warning in the East African region: A case study of Arusha and Dar es Salaam, Tanzania." International Journal of Advanced Technology and Engineering Exploration, Vol 8 (79), p705-716.

THE NELSON MANDELA AFRICAN INSTITUTION
OF SCIENCE AND TECHNOLOGY

CONTACT US

Dean CoCSE
P.O.Box 447, Arusha
Tanzania
Email: dean.cocse@nm-aist.a.tz

Visit our websites
NM-AIST: www.nm-aist.ac.tz
CENIT@EA website: www.cenit-ea.org



THE SCHOOL OF COMPUTATIONAL,
COMMUNICATION SCIENCES
AND ENGINEERING

Visionary to become a world class institution dedicated to the pursuit and promotion of excellence in Science, Engineering, Technology and Innovation (SETI) and their application for economic growth and sustainable development. The NM-AIST training curricula incorporate innovation and entrepreneurship academia-industry relations aimed at building an academia for society and industry, the institution's development agenda. The curricula also seek to accommodate, enable, stimulate, catalyze and harness the innovativeness and entrepreneurial qualities inherent in the young generation

CoCSE

*No problem can be solved in the same level of
consciousness that created it*
- Albert Einstein

THE SCHOOL OF CoCSE

Information and Communication Technology (ICT) permeates all aspects of modern society: more tasks are automated, activities simplified, systems embedded in systems, machines are learning, scenario are modelled to define complex relationships, data analyzed to extract useful information, these among many, supported by modern electronics minituarization are among the different aspects of focus in the school of CoCSE. CoCSE trains students in Information Communication Science and Engineering (ICSE), Mathematical and Computer Science and Engineering (MCSE), Embedded and Mobile Systems (EMoS), Wireless and Mobile Computing (WiMC) and Information Systems and Network Security (ISNS).

The school of CoCSE hosts the Centre of Excellence for ICT in East Africa (CENIT@EA) and the Centre for High Performance Computing (CHPC).

It always seems Impossible until it's done
-Nelson Mandela

DEGREE PROGRAMMES & SPECIALIZATION

MCSE Programmes (MSc. & PhD)

Applied Mathematics and Computational Science - AMCS
Computer Science and Engineering-CoSE

ICSE Programmes (MSc. & PhD)

Information Technology System Devt and Management -ITSDM
Electronics and Telecommunications Engineering - ETE

CDAC Programmes (MSc.)

Wireless and Mobile Computing - WiMC
Information Systems and Network Security - ISNS

CENIT@EA Programme (MSc.)

MSc. Embedded and Mobile Systems - EMoS

The programmes are designed to foster problem solving approach and techniques & inter and multi disciplinarity. They build skills and competencies in both the specific areas of specialization as well as Business studies and humanities. These skills and competencies include: entrepreneurship, communication, scientific writing, research skills, intellectual property, research ethics and philosophy. These programmes equip students with the necessary knowhow and pushstart/ enhance their careers as entrepreneurs, employees and inspire them to think beyond the classroom.

KNOWLEDGE, SKILLS AND COMPETENCIES

MCSE programmes build competencies in mathematical and computational modelling to analyse physical systems, operating systems, computing architectures, algorithm design and development and various areas of artificial intelligence. ICSE programmes build competencies in the analysis, design, implementation, integration and management of information systems, analogue and digital electronics, IoT, circuit design, and telecommunication systems. CDAC and CENIT@EA programmes are technical programs with substantial practice oriented modules. ISNS focusses on techniques and methodologies that allow creation and management of complex information systems whereas WiMC builds on techniques employed in telecommunication and mobile systems. All programmes include core and elective modules covering many areas including emerging themes in artificial intelligence and data science.

THE CENTRE FOR HIGH PERFORMANCE COMPUTING

CHPC is established to support research and and learning activities. The centre is established by the collaboration between the Indian and Tanzanian government. This collaboration has also led into the establishment of WiMC and ISNS Masters programs



THE CENTRE OF EXCELLENCE FOR ICT IN EAST AFRICA

CENIT@EA is among the African Centres of Excellence funded by the German government. Established as a regional centre CENIT@EA: trains students in EMoS, builds capacity and regional partnership and linkage towards practice oriented teaching, learning & development.



PARTNERSHIPS AND COLLABORATION

