Image source:IMF EAC 2016 report

CENIT@EA
Centre of Excellence for ICT in East Africa
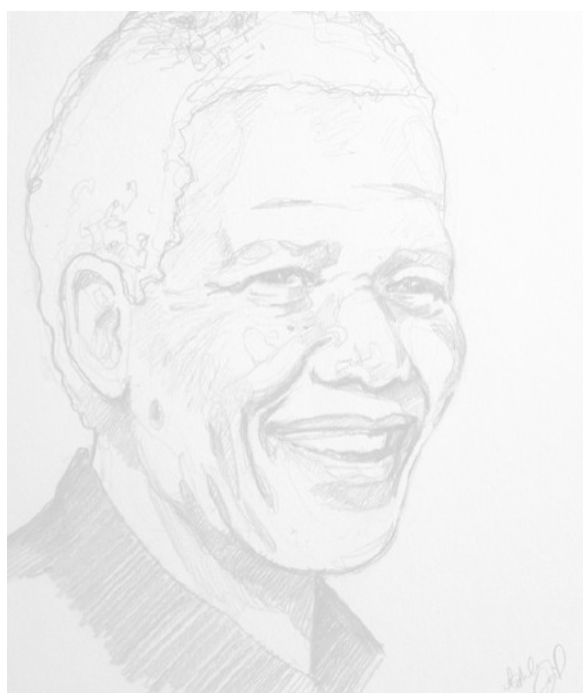
NEWSLETTER

Issue 3: January - September 2020 .

- COVID-19, CENIT@EA Experiences
- CENIT@EA 2nd Cohort Students
- Workshops & Training
- CENIT@EA Partnerships
- Industrial Placement for 1st Cohort students
- Group project presentations for 1st Cohort students
- Concept note presentations for 2nd cohort students
- Appendix 1: 3rd Cohort call for application
- Appendix 2: CoCSE Brochure

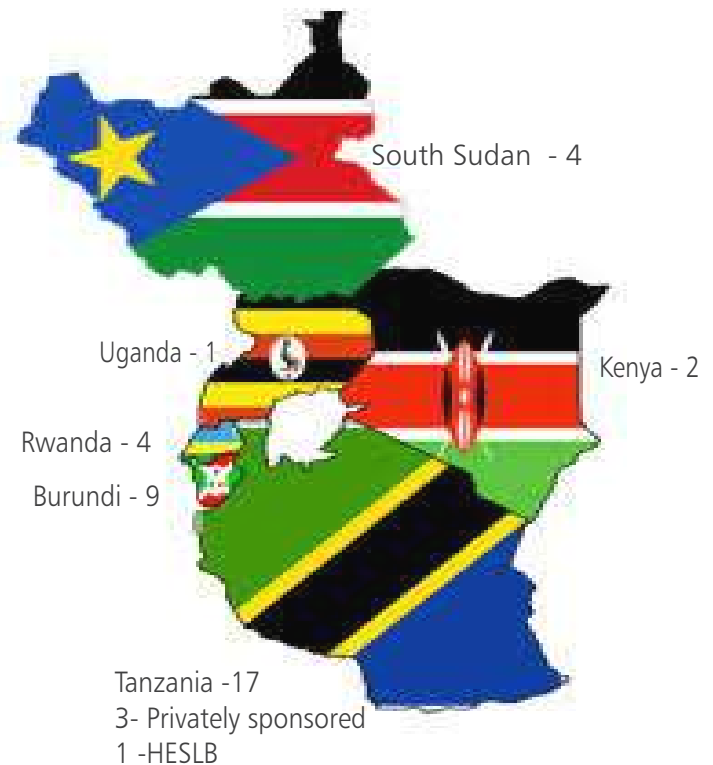## TRANSFORMATIONAL LEADERSHIP

The late Pres. Nelson Mandela instilled the importance of educating and preparing the future generation, the necessity of creating deliberate plans to see transformation at all levels in the society. We at CENIT@EA are dedicated to educating the region, connecting academia and industry and facilitating industry responsive research.

"Ít always seems impossible until it is done"
-Nelson Mandela

CENIT@EA 2ND COHORT STUDENTS

Following competitive selection, a total of 37 students were selected across East African Community member states, with representation from all member states. Among the 37 students, 33 were CENIT@EA sponsored and 3 privately sponsored and 1 studying on a students loan from Tanzania Higher Education Students Loan Board HESLB). The students were welcomed at NM-AIST and started their classes in date 2020. All students received accommodation on campus.

South Sudan - 4

Uganda - 1

Kenya - 2

Rwanda - 4

Burundi - 9

Tanzania -17
3- Privately sponsored
1 -HESLB

CENIT@EA second cohort students, also in the picture: dean of school of CoCSE and lecturers

COVID-19: CENIT@EA EXPERIENCES

In March 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic. NM-AIST implemented measures across the university, to ensure the safety of students, staff and families. Some of the implemented measures included: official sharing of information and raising awareness on COVID-19, its severity in the region and the world and associated preventive measures. This was followed by suspension of physical classes, distribution of face masks and putting in place additional hand washing and sanitizers across the campus.

Following the suspension of physical classes, students returned to home countries/ regions meanwhile virtual classes continued. Some students CENIT@EA students included could not return home as borders were already closed

Virtual classes made us rethink the whole teaching paradigm and the importance of different pedagogical approaches. With profound variation in internet connectivity in the region, it has been a challenging yet an important learning experience for CENIT@EA and NM-AIST.

------ CENIT@EA Centre Leader
Dr. Michael Kisangiri

I could not travel back home, I had to do most things from my room at NM-AIST. The institution and particularly students welfare office has always been very supportive. It was not easy, but the NM-AIST ambient is very condusive for learning and development and that really helped through this time.

------ Ivan Koojo
CENIT@EA Student, Uganda

"..... It was definitely different taking online classes form home Family interruptions, not meeting my lecturers and internet connectivity challenges were something new, but, the continuity of course work was really good and time spent surrounded by loved ones was worth it!"

------ Josephine Mbandi
CENIT@EA Student, Kenya

CAPACITY BUILDING WORKSHOPS

PROFESSIONAL SOFT SKILLS WORKSHOP

Consultant: Mr. Erick Crispin

CENIT@EA organized a five days Professional soft Skills workshop which focussed on personality mastery, critical thinking, effective workplace communication, personal branding, team work and collaborative skills, proffesionalism, and transformational leadership and management. The workshop employed various approaches to learning including role plays, games, discussions, assignments and and group work

"…. engaging and participatory sessions, some of the new skills I learnt included: how to get out of comfort zone, communicating effectively, and creating a strong online presence through social media".

----- Amran Hassan
CENIT@EA Student, Kenya

ONLINE PROJECT MANAGEMENT TRAINING

Consultant: Dr. Theophil Assey

Amidst the time when most students were home due to COVID-19 pandemic, CENIT@EA organized an online profesional training on ICT Project management. The training was focussed on equipping students with practical skills to plan, manage and execute ICT projects in industry. Participants learnt these concepts through brainstorming sessions in teams and case studies.

CENIT@EA PARTNERSHIPS

KIIRA MOTORS

CENIT@EA signed an MoU with KIIRA motors in June 2020. This cooperation is an opportunity for applied research and internship placement, linking students with industry practitioners in such areas as the design and management of information and management systems. This cooperation is envisioned to be important in forging deeper cooperation in research and collaborative projects with the centre and NM-AIST.

RAHA BEVERAGES

CENIT@EA entered into a MoU with Raha beverages in May 2020. as a refreshment production company, Raha is highly dependent on embedded and information systems in daily operations. This MoU is to forge a cooperation and learning experience for both partners. Students are expected to participate in enhancing machinery embedded systems, management of and how to improve the production and information systems

CENIT@EA IST COHORT INDUSTRIAL PLACEMENT

Established as a demand based program CENIT@EA's MSc. EMoS programme incorporates an outreach module in which students are placed in industrial /institutional/ research settings to interact with practitioners, learn, identify challenges and offer solutions. Depending on the nature of the problem and proposed solution, these projects may then be pursued as masters theses for the respective students. In effort to establish academia and industrial linkage, CENIT@EA with the support of GIZ is continously seeking partners to not only give students meaningful experiences of actual challenges and opportunities but also forge deeper collaboration in training and research.

Company: KIIRA Motors
Sector: Automotive
Country:Uganda
CENIT@EA students: Jevinarlys Khamasi, KE
Ivan Koojo, UG

Organization: East African Community (EAC) Secretariat
Sector: Regional Institution
Headquarters: Tanzania
CENIT@EA student: Ange uwayisenga, RW
Yahya Maalim, TZ
Deo Irankunda, BU

Organization: Eastern Africa National Networks of AIDS
and Health service Organizations (EANNASO)
Sector: Health
Country: Tanzania
CENIT@EA students: Happiness Alexander, TZ
Emil Patrick, TZ

Organization: The Medical Concierge Group (TMCG)
Sector: Health
Country: Uganda
CENIT@EA students: Henry Semakula, UG
James Obira, UG

CENIT@EA IST COHORT INDUSTRIAL PLACEMENT

Institution: World Agroforestry Centre (ICRAF)
Sector: Research
Country: Kenya
CENIT@EA students: Josephine Mbunda, KE

Company: RIVATEX Limited
Sector: Information Technology Assembly
Country: Kenya
CENIT@EA students: Philemon Rotich, KE

Company: SOSOMA Industries
Sector: Agroprocessing
Country: Rwanda
CENIT@EA student: Hungurimana Olivier, RW

Organization: Micro Heath Initiative
Sector: Health
Country: Tanzania
CENIT@EA students: Martine Lyimo, TZ
                                John Mbonimpaye, TZ

CENIT@EA 1ST COHORT INDUSTRIAL PLACEMENT

Company: SoftMed
Sector: Information Technology Consulting
Country: Tanzania
CENIT@EA student: Shakila Mshana, TZ

Company: RAHA Beverages
Sector: Manufacturing
Country: Tanzania
CENIT@EA students: Samwel Kitwale, TZ
                    Victor Willa, TZ
                    Ngollo Daudi, TZ

Institution: Inter University Council of East Africa (IUCEA)
Sector: Regional Institution
Country: Rwanda
CENIT@EA student: Alban Manishimwe, UG

Institution: Tanzania Atomic Energy Commission (TAEC)
Sector: Government agency/Research institution
Country: Tanzania
CENIT@EA student: Anna Geofrey, TZ

Company: A to Z Textile Mills Limited
Sector: Manufacturing
Country: Tanzania
CENIT@EA students: Beatus Mbunda, TZ
                    Hillary Rambo, TZ

CENIT@EA IST COHORT INDUSTRIAL PLACEMENT

Company: IDI - Ugandan Academy for Health Innovation
and Impact
Sector: Research Institution
Country: Uganda
CENIT@EA students: Hillary Kaluuma, UG

Company: ROK Industries
Sector: Manufacturing
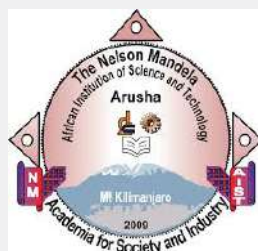Country: Kenya
CENIT@EA student: Fabien Ngabonyimbere, RW

Academic Institution: Pwani University
Sector: Academia
Country: Kenya
CENIT@EA student: Amran Hassan, KE

Institution: NM-AIST, Embedded systems lab
Sector: Academic Institution
Country: Tanzania
CENIT@EA student: Gloriose Nzasangamariya,TZ

CENIT@EA IST COHORT GROUP PROJECTS

Document Digitization Application

This project aimed at developing document digitizer mobile application. This application incorporated the knowledge of optical character recognition. The application simplifies document digitization, document format conversion and text extraction from images. Collectively these simplify the handling, editing and sharing of documents.
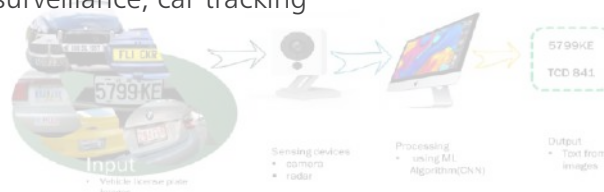

Supervisors: Dr. Dina Machuve, Dr. Shubi Kaijage, Dr. Neema Mduma

Left to right: John Mbonimpaye
Victor Willa

Automatic Number Plate Detection and Recognition System using Machine Learning Algorithm

This project aimed at developing vehicle plate number recognition system. Due to increase number of vehicles monitoring is a challenge. This system is to support other systems and functions such as: toll payment, parking management, traffic surveillance, car tracking and crime investigation
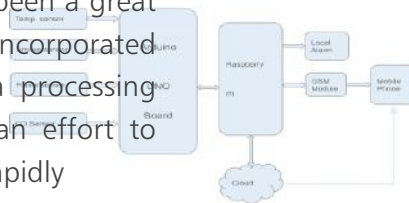

Supervisors: Dr. Dina Machuve, Dr. Shubi Kaijage, Dr. Neema Mduma

Left to right: Gloriose Nzasangamaria
Favor Wisdom Ceaser
Ivan Koojo

CENIT@EA I^{ST} COHORT GROUP PROJECTS

Early Fire Detection System, case study: Tanzania Markets

This project aimed at developing a smart system for early detection of fire outbreaks in market places. Fire outbreak in Market places has a been a great challenge for a while now. The system incorporated the following systems: sensors, data processing and a mobile application. This is an effort to counteract market fire which spread rapidly
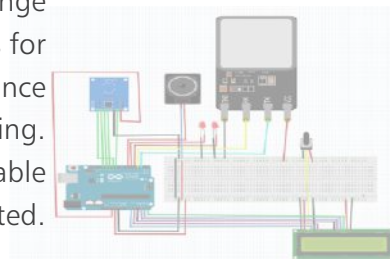

Supervisors: Dr. Anael sam, Dr. Kisangiri Michael, Dr. Neema Mduma

Left to right: Rambo Hillary
Philemon Rotich
Anna Geoffrey

Bimodal Fingerprint and RFID based Attendance System

This project aimed at designing and implementing an automated system to monitor attendance. Being bimodal this system overcomes the challenge of unimodal system. The system uses RFID tags for identification, server to maintain the attendance database and as well allowing for report printing. This is low cost solution that may be applicable in schools where resources are rather limited.
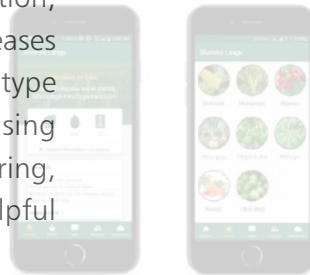

Supervisors: Dr. Anael Sam, Dr. Judith Leo, Dr. Ramadhani Sinde

Left to right: Hungurimana Oliver
Fabien Ngaboyimbere
Deo Irankunda

CENIT@EA 1ST COHORT GROUP PROJECTS

Development of a Smart Agriculture System based on Mobile Technology and Internet of Things (IoT): Towards Digital Farming.

This project aimed at developing a digital farming application and prototype that uses AI and IoT. The end goal is to give farmers access to information, markets, training, expertise, finance and diseases detection and control. Meanwhile the prototype demonstrate the achievable opportunities using sensors, clod connection and front end monitoring, the mobile application provides features helpful to support modern day farming.
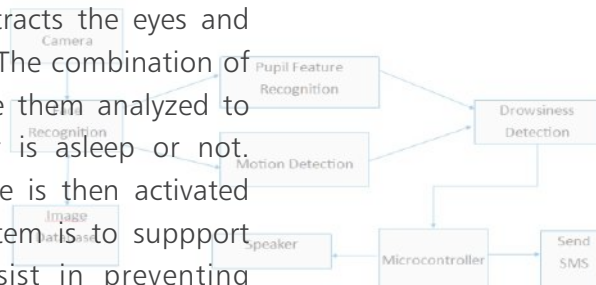

Supervisors: Dr. Shubi Kaijage, Dr. Judith Leo, Dr. Neema Mduma

Left to right: Shakila Mshana
Yahya Maalim
Emil Patrick

Public Transport Vehicle (PSV) Drowsiness Detection using Raspberry pi and NoIR camera"

This project aimed at drowsiness detection. The developed prototype captures real time images of the driver and feeds to the microcontroller which custom algorithms which extracts the eyes and head motion from the image. The combination of the eyes and head motion are them analyzed to determine whether the driver is asleep or not. A corresponding alert message is then activated through the speaker. This system is to suppport traffic management and assist in preventing road accidents

Supervisors: Dr. Kisangiri Michael, Dr. Judith Leo, Dr. Ramadhani Sinde

Left to right: Josephine Mbunda
Jevinarlys Khamasi
Ange Josiane Uwayisenga

CENIT@EA IST COHORT GROUP PROJECTS

A mobile System supported by Wireless Sensor Networks Application for Air Pollution Monitoring

The project aimed at developing a mobile aplication to monitor air quality and report pollution in real time. It includeda low cost wireless sensor network and a centralized air pollution monitoring system. The envision benefits of the system include providing real time data to environmental authorities and support environmental conservation efforts.
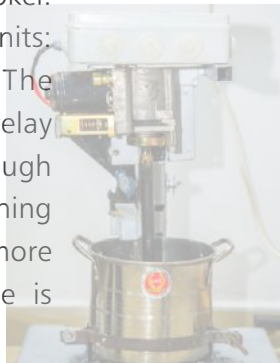
Supervisors: Dr. Kisangiri Michael, Dr. Shubi Kaijage,
Dr. Neema Mduma

Left to right: Martine Lyimo
Jimmy Obira
Henry Semakula

Smart Ugali Cooker

The project aimed at developing a smart Ugali cooker. This prototype incorporated   the following units: four dispenser, stirring, electric control. The functioning included temperature sensors, relay switch, motor and Xbee shields elements. Although the unit is at a rather mechanical stage, fine tuning of its characteristics and elements to make a more sophisticated, user friendly unit for home use is project worth looking into.

Supervisors: Dr. Mussa Dida, Dr. Kisangiri Michael
Dr. Neema Mduma

Left to right: Amran Hassan
Samwel Katwale
Ngollo Daudi

CENIT@EA IST COHORT GROUP PROJECTS

Mobile Application for Integrated Stock
Market in East Africa

This project aimed at designing and developing a centralized market place platform for selling and buying stocks in East Africa. The application included subsystems for payment options and stock price forecasting. The envisioned benefits of the application include further promotion and fostering of regional integration, encouraging competition in the region as well as reduction of transaction time.

Left to right: Alban Manishimwe
Happiness Alexander
Hillary Kaluuma

Supervisors: Dr. Mussa Dida, Dr. Judith Leo,
Dr. Neema Mduma

CENIT@EA first cohort students done with project presentations, ready to begin the industrial outreach module, also in the picture are CENIT@EA staff. September 2020

CENIT@EA MEETINGS

CENIT@EA 5th Joint Steering Committee Meeting, 26 May 2020

CENIT@EA had its 5th Joint Steering Commitee (JSC) on the 25th May 2020. This was an online meeting with the appointed members of the JSC as well as invitees. The meeting discussed the centre's: administrative and students' related activities and their status, outputs and achievements, challenges and the way forward. Among deliberations achieved included: the appointment of a new member of CENIT@EA JSC from the University of Oldenburg, Prof. Dr. Verena Pitzner and the approval of the July 2020 to March 2021 CENIT@EA joint workplan.

Karibu CENIT@EA Prof. Pietzner

Prof. Dr. Pietzner is a chemistry didactics professor at the university of Oldenburg. She is also the Vice President for instruction and international affairs in which position she is highly involved in university and international activities.

CENIT@EA 5th Jour Fixe

CENIT@EA has regular jour fix emeetings. Through these meetings, the technical team catches up on daily ativities of the centre, upcoming events and planning. These meetings offer an opportunity for all players to be on the same page as far as the centre and its activities are concerned

CENIT@EA 2ND COHORT STUDENTS' GROUP PROJECTS

Second cohort students presented their group work concepts in 25th September 2020. These presentations aimed at fine tuning the ideas into workable projects. Some of the initial presented group projects are as seen below. in the course of the presentations, reviewers gave comments to review the

Electricity consumption information in a smart house

Industrial air pollution management

Web-mobile student information management system a case of NM-AIST

Smart card management system for water sale based on RFID

Mobile bus ticketing system

Smart electronics billboards

Smart Maasai cattle grazing system

Automatc railway-road crossing traffic light

Smart electronics billboards

Smart Library direction system

CENIT@EA UPCOMING EVENTS

CENIT@EA Digital Skills Accelerator	Digital Skills accelerator Program aims at reaching out to EAC individuals and train them on particluar skills to enhance their capacity towards self/ third party employment
CENIT@EA 6th Joint Steering Committee meeting	CENIT@EA JSC brings together selected stakeholders whose decisions steer the direction of the centre. JSC monitors that the challenges and opportunities are addressed and the centre achieves sets targets
CENIT@EA 2nd summer school	CENIT@EA summer school bring together students and experts from across EAC to share knowledge, skills and expertise, inspire deeper discussion on subject matter and enhance networking in the region.
Third cohort scholarship selection	Interested applicants must apply for MSc. EMoS admission at NM-AIST through this link https://oas.nm-aist.ac.tz:8443/noas/, students who are admitted to the program can then apply for scholarship in the process attaching their admission letter through this link, https://www.cenit-ea.rg/embedded-and-mobile-sytems-msc/scholarships/apply-now/. Applicants without admission are not eligible for CENIT@EA scholarship
CENIT@EA 1st conference	CENIT@EA plans to have its first international conference in 2021. This conference aims at bringing together embedded and mobile systems students, experts, lecturers and industries to discuss: trends, solutions, state of the art and other issues related to embedded and mobile systems

CENIT@EA Team

CALL FOR MASTERS APPLICATION

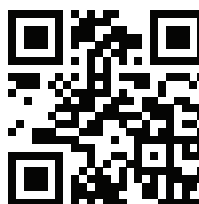## MASTER OF SCIENCE IN EMBEDDED AND MOBILE SYSTEMS (EMOS)

HOSTED AT
NM-AIST (ARUSHA, TANZANIA)
CENTRE OF EXCELLENCE FOR ICT IN EAST AFRICA (CENIT@EA)

Are you East African and passionate about making an impact with ICT? Do you want to be affiliated with an international university-industry network?

APPLY NOW!

Earn a full scholarship to study the Master's programme.

VISIT
www.cenit-ea.org

DEADLINE: 30TH OCTOBER, 2020

FOR ENQUIRIES EMAIL
ON SCHOLARSHIP:
cenit-ea@uni-oldenburg.de
EMOS APPLICATIONS:
admission@nm-aist.ac.tz

Female candidates are particularly encouraged to apply.

CENIT@EA
Centre of Excellence for ICT in East Africa

"DEDICATED TO EXCELLENCE, COMMITTED TO THE FUTURE"

The Nelson Mandela
African Institution of Science and Technology
Arusha
Mt Kilimanjaro
2009
Academia for Society and Industry

german cooperation
DEUTSCHE ZUSAMMENARBEIT

gíz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

DAAD Deutscher Akademischer Austauschdienst
German Academic Exchange Service

Carl von Ossietzky
Universität Oldenburg

THE NELSON MANDELA AFRICAN INSTITUTION OF SCIENCE AND TECHNOLOGY

CONTACT US

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Email: dean.cocse@nm-aist.a.tz

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

academia for Society and Industry -NM-AIST motto

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

THE SCHOOL OF COMPUTATIONAL, COMMUNICATION SCIENCES AND ENGINEERING

CoCSE

No problem can be solved in the same level of consciousnes that created it

- Albert Einstein

NM-AIST, 2020

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