Makerere University
College of Computing and Information Sciences (COCIS)

ANNUAL REPORT

2019/20

Realizing Outcomes from our Pro-Growth Academic Measures and Actions

PROF. TONNY J. OYANA

COLLEGE PRINCIPAL

We are extremely grateful and privileged to share our Annual Report for Academic Year 2019/20 with Makerere University community. The College is on track to be a thoughtful leader in shaping a strong, shared vision of academic success in ICT flagship research and education.

Although the first six months of academic year 2019/20 have been very exciting and full of significant accomplishments, the last six months have been quite challenging due to the unprecedented pandemic of severe acute respiratory syndrome coronavirus 2 (SAR-CoV-2), that causes Corona Virus Disease 2019 (COVID-19). I anticipate that Science, our collective actions and any other adversity will yield positive outcomes, which will address current hardships that have significantly affected our livelihoods.
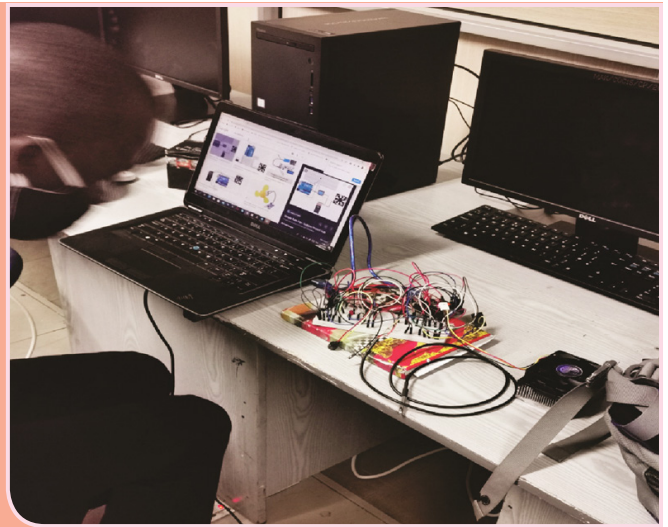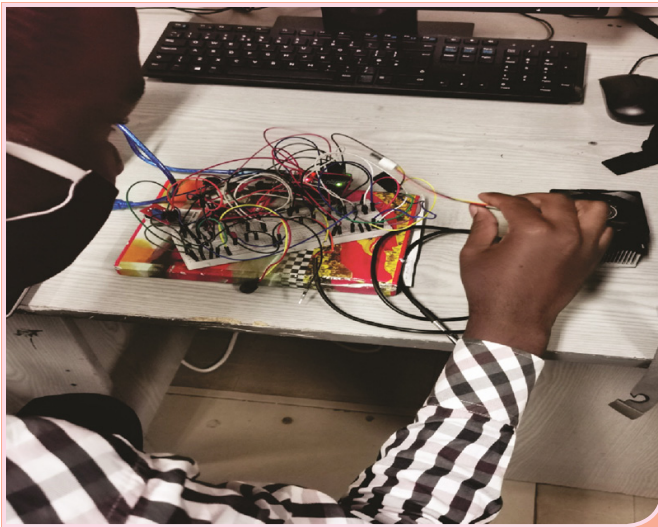
I take this opportunity to thank COCIS staff, faculty, and students for the resilience you have demonstrated and for all you have to do to keep our college moving forward to meet our strategic goals. Achieving academic success continues to remain an intentional outcome of our research and educational activities.

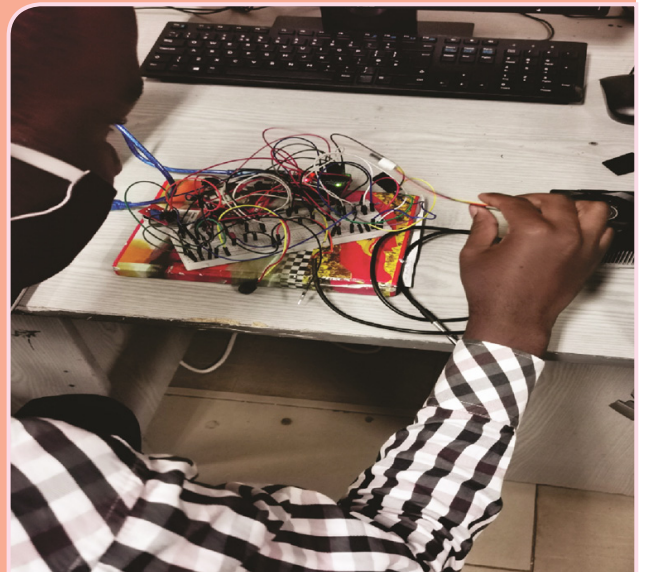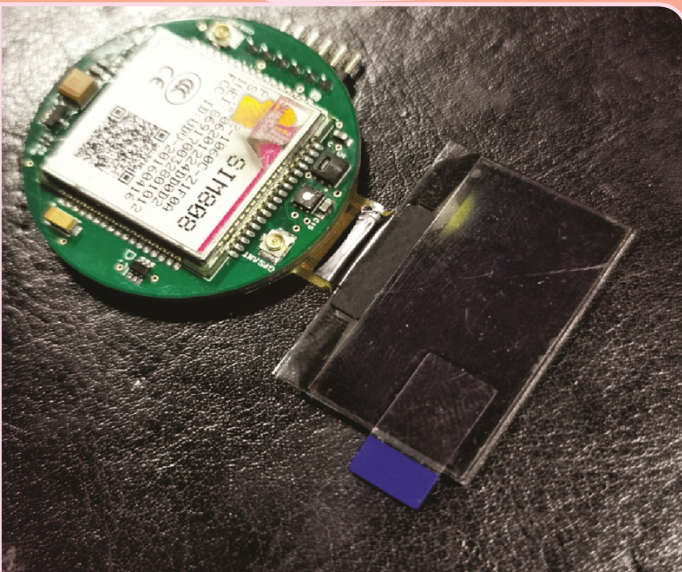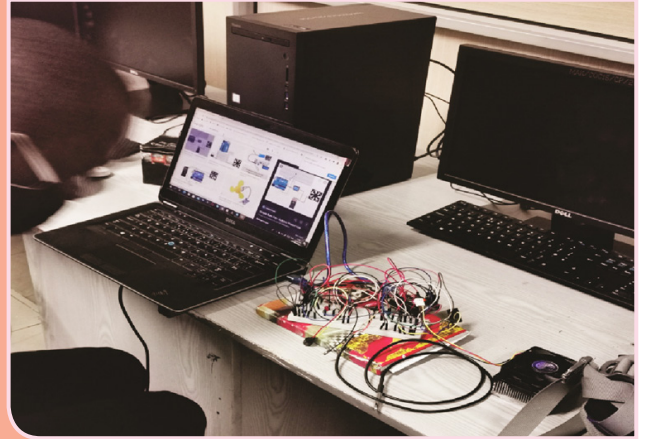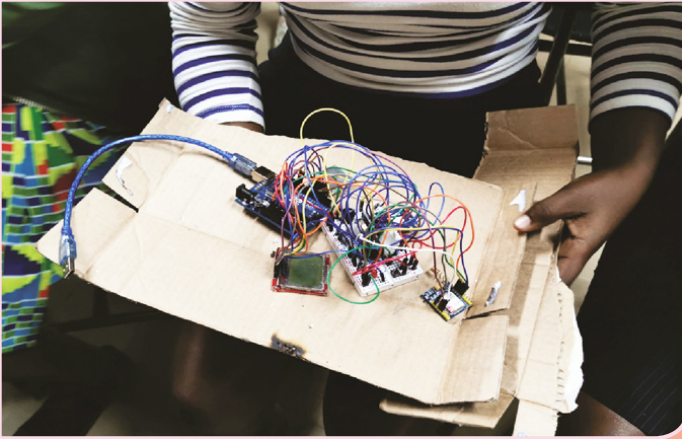Let us continue to live healthier lives and practice good hygiene habits.

This academic year I would like to highlight excellent research and innovations that are being carried by our students and faculty. **Why is our focus on Research and Innovations?** At the heart of our distinctive model of ICT teaching and learning, we ensure the production of fine and high-quality human resource, while with research and innovations, we wish to increase the production of critical breakthroughs of ideas that advances scientific knowledge and innovations. This, we believe, will culminate into technological solutions. Currently, our college has a majority population of young faculty with incredible potential and a top 10% talented crop of students in the nation ready to exponentially push our research and innovations agenda forward. For example, our amazing faculty and students are building IoT sensor devices for smart homes, smoke detection, indoor and outdoor asthma monitoring and management, and robotics.

As College Principal, I appreciate the excellent progress we are making in conducting high-quality research. Our research capacity has significantly grown and it is very strong. We have a total number of 30 active grants secured either internally (22) or externally (10). Our graduate enrolment now stands at 9.6% up from 3% three years ago. We are on a steady march to meet our current target of 15%. This academic year we graduated six PhDs, 24 Masters, and over three faculty successfully completed their PhDs. Our College continues to offer impeccable educational and research opportunities for students and at-large community.

Thank you very much for reading our Annual Report and when you are in Makerere University stop by and visit this amazing college. We are committed as a college to be the leading regional hub for Data Science and AI research.

Examples of our ongoing work Panel 1: Our faculty and students are building IoT sensor devices for smart homes, smoke detection, indoor and outdoor asthma monitoring and management, and robotics.

Examples of our ongoing work Panel 2 : Our faculty and students are building IoT sensor devices for smart homes, smoke detection, indoor and outdoor asthma monitoring and management, and robotics. CoCIS is one of the ten colleges of Makerere University and one of the largest Colleges in Africa that offers undergraduate and graduate training and research in Computing, Informatics and Information Sciences under two Schools.

1. School of Computing and Information Sciences (SCIT)
2. East African School of Library and Information Science (EASLIS)

Buildings

Block A

Administration Block, School of computing and Informatics Technology, (SCIT), Accounts, Procurement, Human Resource
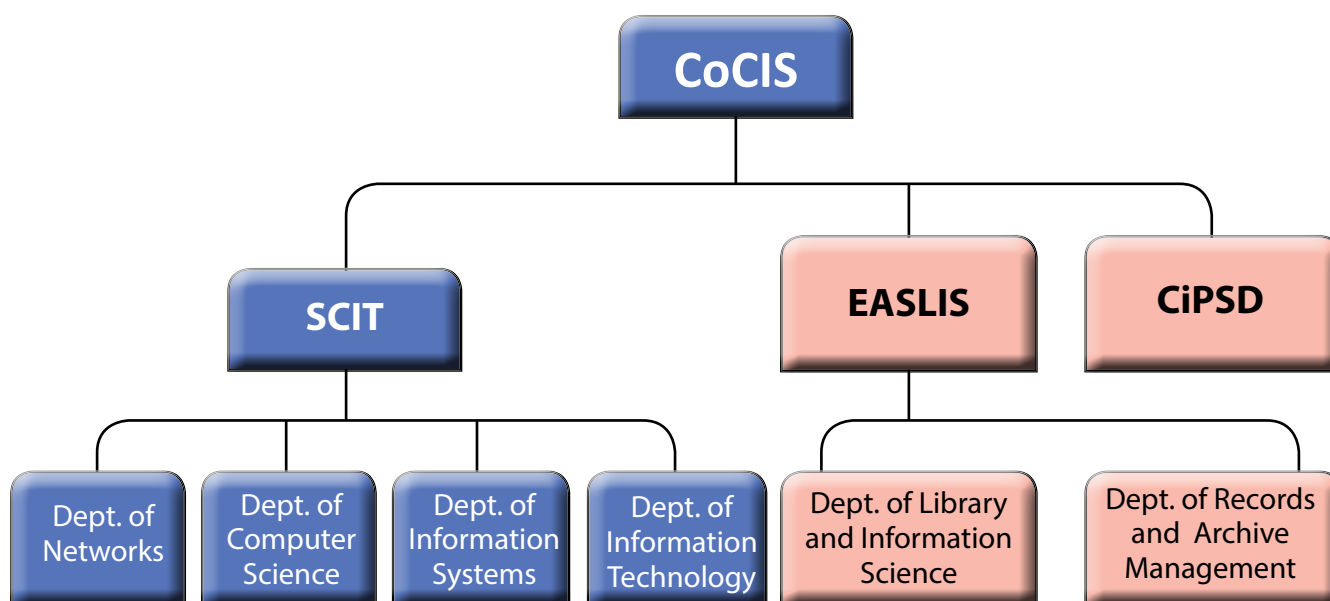

Block B

Lecture Rooms, Computer Labs, Innovation centre, Research Labs, Registratrar's office

Block C

East African School of Library and Information Sciences (EASLIS)

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                          CoCIS
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        SCIT             EASLIS            CiPSD
   ┌──────┬──────┬──────┐      ┌──────────┬──────────┐
 Dept. of  Dept. of  Dept. of  Dept. of   Dept. of Library  Dept. of Records
 Networks  Computer  Information Information and Information and  Archive
           Science   Systems    Technology  Science          Management
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1. SCIT Programmes

SCIT offers both Undergraduate and Postgraduate Programmes. These fall under the different departments illustrated in the structure above

1.1 Undergraduate Programmes

a) Bachelor of Science in Computer Science (BSc. CS)
b) Bachelor of Information Systems and Technology (BIST)
c) Bachelor of Science in Software Engineering

1.2 Postgraduate Programmes

a) Postgraduate diploma in Information Technology
The programme focuses on Information security, Information Technology management, internet and service delivery, and Internet and web computing. Action learning is used where students individually and in groups access and apply IT frameworks to projects and assignments at work environments.

b) Postgraduate Diploma in Information Systems
This course focuses on areas such as Computer Information Systems, Management Information Systems, Information Systems Management, internet and databases. It is designed to give students a thorough knowledge of the field and to provide an enduring foundation for future professional growth. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems

c) Postgraduate Diploma in Computer Science
The programme focuses on areas such as algorithms, programming environments, computing, artificial intelligence and expert systems. It is designed to give students a thorough knowledge of the field and provide an enduring foundation for future professional growth. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems

d) **PhD by Coursework and Research**

e) **Master of Information Technology**

The world today is facing a range of new technologies that combine digital, physical and biological worlds. Modern business is shaped by technological change, competitiveness and globalization.

The programme focuses on Information security, Information Technology management, internet and service delivery, and Internet and web computing. Action learning is done through Focus group discussions, individual coursework, projects and assignments at work environments

f) Master of Science in Data Communications and Software Engineering (PGDCSE)

This programme has been designed to create a critical mass of professionals in Data Communications Engineering, Network and System Administration and Software Engineering at Universities and other tertiary institutions, the public and private sectors. Therefore, students interested in becoming Network and System Administrators and Software Engineers are invited to pursue this course.

g) Master of Science in Computer Science (MCSCS)

This programme focuses on areas such as algorithms, programming environments, computing, artificial intelligence and expert systems. It is designed to give students a thorough knowledge of the field and provide an enduring foundation for future professional growth. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems

h) Master of Science in Information Systems (MSCS)

This course focuses on areas such as Computer Information Systems, Management Information Systems, Information Systems Management, internet and databases. It is designed to give students a thorough knowledge of the field and to provide an enduring foundation for future

professional growth. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems

i) PhD by Coursework and Research

2. EASLIS Programmes

EASLIS offers both Undergraduate and Postgraduate Programmes

2.1 Undergraduate Programmes

a) Diploma in Records and Archives Management (DRAM)
b) Diploma in Library and Information Studies (DLIS)
c) Bachelor of Library and Information Science (BLIS)
d) Bachelor of Records and Information Management (BRAM)

2.2 Postgraduate Programmes

a) PhD in Information Science
b) Master of Science in Information Science
c) Master of Science in Records and Archives Management

Setting Priorities for Academic Success

When I became the College Principal, I set out three priorities that was positively embraced by College Management, to accelerate academic success. We have been working hard together towards accomplishing these priorities. I am happy to report that we are strongly moving in a positive direction three years later.

Increasing research productivity is my number one priority for my four-year term and is also COCIS' strategic goal. To achieve this goal, we have reorganized and strengthened our Grant's Office into Research, Innovations, Services and Engagements (RISE) Office. This unit received stronger funding support from the Office of the Principal; support was provided to build a strong research infrastructure we need to succeed. Six project teams were supported with funding opportunities to conduct novel research. Improving/enhancing teaching and learning is my

number two priority for my four-year term and is also COCIS' strategic goal. To achieve this goal, we have emphasized the integration of hands-on pedagogy in courses, team projects, capstone projects, servicing learning opportunities, personalized approaches to students, tutor-based discussion and help, career resources, guidance and counselling, and incorporation of forward-looking technologies and interdisciplinary applications. Engaging students in labs with fresh content is extra work and very demanding, however, we have to update and revitalize our course content. We have skilled all faculty with pedagogical training, thus giving our students a very positive and memorable learning experience.

Promoting outreach and engagement is my number three priority for my four-year term and is also COCIS' strategic goal. To achieve this goal, we have done two things: 1) strengthened outreach and engagement activities among alumni, schools, and at-large community; and 2) proposed a permanent college endowment fund.

We have retooled our instructional materials and content, renovate our core facilities, and rebrand our college with a fine-tune messaging that promotes academic excellence. These efforts have helped us to provide a better learning experience, thus increasing students' success. It is our solemn duty to make this happen, especially in a college that prides itself in maintaining the highest standard of academic integrity. We have an amazing college with strong core values, which are very dear to us and should be used to give us a strong identity for steering our college to greater heights.

The Purpose of the College

Vision

- To be a leader in computing and information sciences education, research and services internationally.

Mission

- To provide transformative innovative teaching, learning, research and services in Computing and Information Sciences responsive to dynamic national, regional and global needs.
- To provide first class teaching, research and services in computing and information sciences to national and international need

Key cost drivers

1. Student numbers
2. Staff members
3. Academic Programmes
4. Other activities (where applicable)

Values

1. Accountability
2. Professionalism (Commitment, Responsiveness, Efficiency & Effectiveness)
3. Respect (Friendly & Gender Sensitivity)
4. Integrity (Honesty & Transparency)
5. Inclusivity (Gender Sensitivity, Disabled, & Marginalized)

Core objectives

1. To provide graduates with information science and computing skills, competencies and attitudes that meet the current and emerging needs for societal development.
2. To conduct high quality research and innovations that generate tested contextual ideas and sustainable solutions for contemporary, emerging, strategic societal needs.
3. To effectively recruit, nurture and deploy talent for efficient delivery of the University's mission.
4. To create and sustain an enabling environment for university operations underpinning optimal utilization of resources.

The focus is principally on five critical themes that the College of Computing and Information Sciences (COCIS) is engaged in. These are Teaching and Learning, Research and Innovations, Research Dissemination and Community Engagement and Outreach Activities, Finance and Human Resources, and Other Support Functions and Professional Skills Development.

1. TEACHING AND LEARNING

1.1 Enrollment – Academic Year 2019/2020

SN	School	Level	Enrolled	Registered	Did Not Register
1	East African School of Library and Information Science (EASLIS).	(a) Graduate	55	32	23
		(b) Undergraduate	1126	1059	67
		Subtotal a + b	**1,181**	**1,091**	**90**
2	School of Computing and Informatics Technology (SCIT).	(a) Graduate	188	86	102
		(b) Undergraduate	1661	1,476	185
		Subtotal a + b	**1,849**	**1,562**	**287**
	TOTALS (EASLIS + SCIT)		**3,030**	**2,653**	**377**

1.2 Out-put: Statistical Summary of Graduates at the 70th Graduation Ceremony in January 2020

SN	Qualification	Female	Male	Total
1	Doctoral Degrees	3	3	6
2	Masters Degrees	6	18	24
3	Postgraduate Diplomas	1	1	02
4	Bachelors' Degrees	372	408	780
5	Undergraduate Diplomas	13	4	17
	GRAND TOTAL			829

1.3 Progress meeting annual goals

1. There has been an Increase in the number of international students at PhD level at the East African School of Library and Information Sciences.
2. Initiation and actualization of staff and student exchange with the University of Boras in Sweden.
3. BLIS programme was revised and forwarded to Senate and Quality Assurance for consideration and approval.
4. Stakeholders Curriculum review for graduate Programmes: PhD in Information Science and Master of Science in Information Science were done on 25th to 27th July 2019 and awaiting input by the Department.
5. Workshop on open-source software e.g., demonstration of KOHA was held on 1st and 2nd August 2019 and staff were trained on setting up records and archives management systems.
6. Pedagogical skills training workshop was done for all teaching staff from 12th to 14th August 2019. Staff designed online course outlines, and many are teaching via MUELE.
7. Notable staff teaching activities and accomplishments (Study trips to the Uganda Museum by Ms. Lois Mutibwa for the course BRM 3201: Management of Museums) was accomplished.

1.2 Examinations

Semester I

Examinations were successfully completed thanks to the dedicated staff and coordinators at the College.

Semester 2

Examinations have been postponed because of the situation posed by the COVID-19 Pandemic

1.4 Curriculum Review

(iii) All Departmental Programmes were revised and forwarded to Senate and Quality Assurance for consideration and approval.

(iv) Stakeholders Curriculum review for graduate Programmes: PhD in Information Science and Master of Science in Information Science were done on 25th to 27th July 2019 and awaiting input by the Department.

(v) The department of Computer Science held two sessions including 1) implementation and revision of Master of Science curriculum, 2) running a new curriculum in software systems security, artificial intelligence and data science.

(vi) The Department of Networks reviewed Bachelor of Science in Software Engineering and Developed a new programme: B.Sc. Data Communications Networks both in final stages, hoped to run in the next academic year.

1.5 Staff Training

a. ICM Linnaeus Palme project with east African School of library and Information Science

b. Workshop on open-source software e.g., demonstration of KOHA was held on 1st and 2nd August 2019 and staff were trained on setting up records and archives management systems.

c. Pedagogical skills training workshop was done for all teaching staff from 12th to 14th August 2019. Staff designed online course outlines, and many are teaching via MUELE.

d. Notable staff teaching activities and accomplishments (Study trips to the Uganda Museum by Ms. Lois Mutibwa for the course BRM 3201: Management of Museums) was accomplished.

1.6 Field Attachment

Sem I

a. This was well conducted effectively from 6th June to 3rd August 2019 for BLIS and BRAM Year II students.

Sem II

b. This has not been done because of the situation posed by the COVID-19 pandemic

1.7 Recess term

This has not been done because of the situation posed by the COVID-19 pandemic

1.8 Courses completed on E-learning platform at EASLIS

- BLS 3221: Management of Electronic Resources
- Management of Electronic Records
- Information Technology I and II
- Documentation Work & Services
- Database Management & Information Retrieval
- Analysis of Records Management systems
- Management of Museums

1.9 Pedagogy training

a. Both EASLIS and SCIT successfully completed the pedagogy training in November 2019 and January 2020 respectively. This is expected to improve the teaching and learning experiences of both students and staff. Other objectives of the training are;

i. Provide active learning experiences, where students are engaged, active and corporative. Peer to peer leaning should be adopted.

ii. To motivate students to learn and self-assess their abilities pre and post.

iii. Improve the quality of teaching

iv. Improve the course content before it is delivered for example through articles.

2. RESEARCH AND INNOVATION

2.0 Staff Evaluation

During semester two of the academic year 2018/2019 an evaluation exercise took place across all Programmes and even during the recess of that particular semester, the same exercise was done. Depending on students' response, staff were called on individually to discuss the output where there was need.

The RISE directorate continues to strengthen research and innovation at the College under the leadership of Dr. John Ngubiri. The Directorate has departmental representatives across the two Schools who represent their respective Departments on the RISE Committee. The unit receives strong funding support from the Office of the Principal to encourage faculty to engage in research. In this quarter, a total of 06 RIF grants were awarded and currently 15 are being implemented.

a) Awarded Grants

In AY 2019/20, we received nine seed grants totaling 79,612,500/=, six research seminar presentations by staff, our College seed grants have yielded 20 RIFs and six external grants as shown in the tables below;

S/N	Title	Amount (UGX)	Period	Team Members
1	Multilingual end-to-end deep speech recognition for the Ugandan context	20,000,000	June-Dec 2020	Dr. Peter Nabende (PI); Research Assistants
2	Electronic Service for Locating and Assessing Care Programmes for Patients with Chronic Conditions (LACRO): Feasibility Study in Uganda	15,000,000	June-Dec 2020	Dr. Agnes Nakakawa (PI), Dr. Joab Agaba, Flavia Namagembe, Irene Arinaitwe
3	Exploring Flora, Fauna and Mineral Diversities in Uganda's Lake Victoria Basin using Artificial Intelligent Sensing Technologies	15,000,000	June-Dec 2020	Dr. Odongo Steven Eyobu, PhD (Principal Investigator), Prof. Tonny Oyana and Mary Nsabagwa, Msc.
4	Development of a mobile application to harness secure access and utilization of sexual and reproductive healthcare services among female young adults aged 15-24 years.	14,922,500	June-Dec 2020	Dr. Alice Mugisha
5	Mobifuel (Student Seed – Continuous category)	5,000,000	June-Dec 2020	Mr. Albert Bitwire, Department of Computer Science
6	Perspectives on Utilization of Open-Source Library Systems: A case of Library Professionals using KOHA Software in Uganda	19,690,000	June-Dec 2020	Dr. Joyce Bukirwa (Lecturer) – Lead Researcher, Mr. Richard Batte (Assistant Lecturer), Ms. Lois Mutibwa Ms. Claire Wessaali (MSc Student) & Ms. Suzan Nattembo (MSc. Student)
7	First Responder Emergency Service System (RISE funded students seed grant)	5,000,000	June-Dec 2020	Dr. Swaib Kyanda Project Co-PI (Lecturer Networks, Ag. HoD Networks)
8	CASE FOR SUPPORT: Gender-Just Digital Innovation in Africa (GeDIA).	£135,000	June-Dec 2020	Fiona Ssozi Co-I, Co-Director, Lecturer in

	Uniting women changemakers in Africa (and their male allies) to co-design digital futures for all	£135,000	June - Dec 2020	Information Systems, Coordinator of the Development Informatics
9	East African Digital Solutions to Air Quality Network: UKRI Grant		July-Sept 2020	Assoc. Prof. Engineer Bainomugisha

RIF GRANTS: COVID-19 RESPONSE July-Sept 2020				
1	COVID-19 Rapid Response-"A Mobile and Web based Application for Reporting Suspicious Cases of COVID 19 and Monitoring Discharged Patients"	59,960,000	July-Sept 2020	Mr. Male Vincent
	Data-Sanitiser: Semi-Automated Identification and Fact-checking of Viral COVID19 Related Posts Using Online Expert Panels	60,000,000	July-Sept 2020	Mr. Mark Magumba
2	Virtual Reality Technology for Optimizing Safety and Competence in Management of COVID-19 Patients	59,997,221	July-Sept 2020	Dr. Daudi Jjingo
3	Information Seeking Behaviour of Secondary School Students during Lockdown in Uganda (Joyce Bukirwa)	54,712,000	July-Sept 2020	Joyce Bukirwa
4	Freelance / Remote Jobs Marketplace Platform	60,000,000	July-Sept 2020	Dr. Emily Bagarukayo
5	An information Portal to Support Gender Based Violence Initiatives	60,000,000	July-Sept 2020	Assoc. Prof. Gilbert Maiga
6	Understanding the Dynamics of COVID-19 Pandemic Lockdown in Urban Poor Communities: A Systems Thinking Model	59,956,800	July-Sept 2020	Assoc. Prof. Agnes Rwashana Semwanga

2.1 Current progress

1. Two Graduate Research Assistants and two undergraduate interns were appointed to support research activities and engagements within research groups
2. The Directorate organized an Alumni engagement dinner; however; preparations have been postponed due to threats posed by the pandemic. In addition, an alumni database was developed in order to keep connection and communication with all alumni.
3. Intra Research Groups Capacity Development continue to be maintained through regular research group meetings where staff and students are facilitated by guest lectures on current issues related to the specific research groups. The following research groups have actively carried out research meetings;

   a) Artificial Intelligence lab
   b) Software Systems Centre
   c) Wireless Networks and Systems Security
   d) Development Informatics
   e) Embedded Systems
   f) Cyber Security
   g) Health Informatics
   h) Geospatial and Computational Intelligence Lab
   i) Library and Information Sciences
   j) Records and Archives Management

2.2 Upcoming Activities:

i. Developing the Directorate Research Agenda for RISE
ii. Bi-monthly seminars for all Seed grants awarded under RISE where PIs will share their deliverables and futures plans. Dr. Peter Nabende already hosted a seminar on Towards Automatic Speech Recognition for Ugandan English on Friday, 12th June 2020.
iii. Innovations in teaching and learning including ICT including number of Courses on MUELE.

2.3 New Projects

a) Internal Projects

S/N	Title of Grant	Funder	Amount (UGX)	Grant Period	Research Team
1	Crane Cloud: an open-source multi-cloud service layer for highly available cloud-based services in Africa	Makerere University Research and Innovation Fund	239,300,000	Nov 2019 - June 2020	Assoc. Prof. Engineer Bainomugisha (PI), Alex Mwotil; Dr. Aminah Zawedde, Mr. Joshua Akandwanaho (NITA-U)
2	"ICT Innovations Marketplace (InnoMak): Completing the Innovation-A pp-Adoption-Commercialization cycle"	Makerere University Research and Innovation Fund	45,700,000	Nov 2019 - June 2020	Mary Nsabagwa (PI); Grace Kamulegeya; Aminah Zawedde
3	Development of a university wide timetabling and teaching load management information system	Makerere University Research and Innovation Fund	77,590,690	Nov 2019 - June 2020	Dr. Joab Agaba (PI); Bitwire Albert
4	Strengthening Science, Technology, Engineering, and Mathematics (STEM) Using Gamification in Primary Schools (GamePlus)	Makerere University Research and Innovation Fund	104,000,000	Nov 2019 - June 2020	Dr. Benjamin Kanagwa (PI), Assoc. Prof. Agnes Rwashana, Dr. Evelyn Kahigi
5	Privacy-Preserving Low-Cost Real-Time Traffic Monitoring-at-the-Edge with Computer Vision	Makerere University Research and Innovation Fund	50,000,000	Nov 2019- June 2020	Rose Nakibuule (PI); A. Mutembesa; Ali Hussein
6	A Framework for Establishing Community Multipurpose Telecenters in Karamoja Sub-Region	Makerere University Research and Innovation Fund	76,336,000	Nov 2019- June 2020	Mr. Mwanje Ssenono Aloysius (PI), Dr. Agnes Rwashana Ssemwanga - Deputy Principal (CoCIS), Mr. Ekwaro Francis - Asst. Lec (RAM Dept), Ms. Lois Nankya Mutibwa - Asst Lec (LIS Dept), Mr. Kenneth Kirya Erickson - MSC Info Science Student
7	Data Driven Prevention of HIV among young adults in Uganda	Makerere University Research and Innovation Fund	23,300,000	Nov 2019- June 2020	Dr. Daudi Jjingo (PI);
8	Deep Learning Ultrasound Based Model for Improving Radiographic Chest Opacities Detection	Makerere University Research and Innovation Fund	75,715,933	Nov 2019 - June 2020	Mr. Moses Ntanda (PI); Zeridah Muyinda (Radiologist); Maimuna Nampereza (Sonographer); Fred Lubowa (Radiologist)

9	An automated feedback module for smallholder farmers in crowdsourcing at scale for real-time crop health surveillance.	Makerere University Research and Innovation Fund	107,546,700	Nov 2019 - June 2020	Dr. Florence Kivunike Nameere
10	A Mobile E- Governance Service Advisor (AMESA): A Citizen Centric Process Alignment to Public Service Delivery	Makerere University Research and Innovation Fund	188,642,000	Nov 2019 - June 2020	Assoc. Prof. Gilbert Maiga (PI); Dr. Emily Bagarukayo
11	Exploring the Feasibility for Strengthening Uganda's Health System through Standardizing Digital Health: Architecture, Standards and Knowledge Products (eRegistries)	Makerere University Research and Innovation Fund		Nov 2019 - June 2020	Dr. Josephine Nabukenya (PI)
12	A Mobile Health Individualized Dietary Plan and Behavioral lifestyle tracker for Diabetics in Uganda	Makerere University Research and Innovation Fund	49,830,000	Nov 2019 - June 2020	Dr. Josephine Nabukenya (PI)
13	NetFarmX - "A one Stop Application Connecting Farmers to Genuine Agro Input Suppliers, Agro Output Traders, Retailers, Consumers and Policy Makers"	Makerere University Research and Innovation Fund	50,000,000	Nov 2019 - June 2020	Male Vincent (PI)
14	Makerere university's e-Human Resources Management Systems (e-HRMs)	Makerere University Research and Innovation Fund		Nov 2019 - June 2020	Dr. Josephine Nabukenya (PI)

b) External Projects

1	Seed grant for global challenges theme development. (Long-Term Field Site Network for Health Service and Technology Innovation in Uganda)	Scottish Funding Council – Global Challenge Research Fund (GCRF)	£ 23,112	1st February 2020 – 10th June 2020	Maria Wolters (University of Edinburgh), Kyanda Swaib Kaawaase
2	Remote open learning for mathematics and health education in Nakivale Refugee Settlement, Uganda-Results Follow up	Spider project Dnr: SU-323-5.1.2-0166-20	SEK 100,000	1st February 2020 – 10th June 2020	Dr. Drake Patrick Mirembe (PI)
3	East Africa IPID Chapter		SEK 58,000		Dr. Rehema Baguma (PI)

Conducting a FGD at one of the primary schools under the Remote open learning for mathematics and health education project (ROLE) in Nakivale Refugee Settlement, Uganda

Participants of the FDGs and KII Nikivale Sec School

WIMEA-ICT project meeting held on 2nd and 3rd Oct 2020 at Kasangati Resort Hotel

Group photo with RIF representative during the training workshop at Rider Hotel Mukono

Training Makerere university students on introduction to cloud computing course on 22nd Feb 2020

Tailoring Climate Services for Improved Agricultural Production

Engineer Bainomugisha handing out certificates under Crane cloud project funded by RIF

2.4 Ongoing Projects

a) Internal Projects

1. Fiona Ssozi - Jan-June 2019. Capacitating Educators of Visually Impaired Learners in Using Assistive Technologies, COCIS Seed Funding, UGX 10 Million.
2. Rehema Baguma - Jan-June 2019. An App for Counselling Youth on Pyscho-Social Issues: A Case of University Students, COCIS Seed Funding, UGX 10 Million.
3. Florence Kivunike - Jan-June 2019. Towards a Public Participatory Approach for Evaluating the Quality of e-Government Services to Enable Sustainable Development, COCIS Seed Funding, UGX 10 Million.
4. Hasifah Namatovu - Jan-June 2019. A Smart Sensor-Based System For Detecting Biogas Leakage In The Supply System, COCIS Seed Funding, UGX 10 Million.
5. John Ngubiri - Jan-June 2019. Towards an Efficient Electronic Marketplace for Small-holder Farmers in Uganda, COCIS Seed Funding, UGX 10 Million.
6. Dr. Peter Nabende, Research Assistants, UGX 10,000,000, Towards Automatic Speech Recognition for Ugandan English.
7. Mr. Mark Magumba and Dr. Hasifah Kasuja, An AI Powered Tool for Generalized Disease Surveillance using Unstructured Social Data, UGX 10,000,000.

8. Ms. Mary Nsabagwa (PI), Dr. Swaib Kyanda, Dr. Julianne Sansa-Otim, Mr. Maximus Byamukama (CEDAT), Collaborative Model and hands-on approach to IoT based research for improved research experience, UGX 10,000,000.

9. Dr. Kyanda Swaib (Staff Lead); EKISA RODNEY SIMON OSOMI (student); Akampurira Rugumambaju Mark (student); Tumusiime Mark, Priscila Mbabaz+E11i 1st Responders emergency mobile application (EMApp), UGX 5,000,000.

10. Mr. Grace Kamulegeya (staff lead); Ankunda Dorothy; Alinda Lonnah; Umulisa Natasha; Innocent Muneeza; Marvin Banda; Isaac Mubiru; Ashraf Miiro & Charles Tushabe, Kaseke: A Smart private use breathalyzer for Uganda drivers, UGX 3,000,000

b) External Projects

1. Dr. Joyce Nakatumba Nabende – Gates Foundation Grand Challenges Explorations grant worth US$ 100,000 "Applying AI to Radio and Image Data for Crop Disease Surveillance" funded by the Bill & Melinda Gates Foundation.

2. Assoc. Prof. Engineer Bainomugisha – Google grant worth US$ 1.3m "Improvement of urban ambient air quality by providing low-cost technologies"

3. Engineer Bainomugisha - October 2018-May 2019. Sub-award "Policy Research Program on Pollution Management and Competitiveness of Cities" funded by the World Bank Group cf. US$65,930

4. Engineer Bainomugisha - December 2018-June 2019. Seed Grant "AirQo: Low-cost and Participatory Air Pollution Monitoring" funded by NRF South Africa. cf. Euro 7000

5. Engineer Bainomugisha - Jan 2019-July 2019. Sub-award "Probabilistic low-cost air pollution monitoring " Funded by UK Global Challenges Research Fund - UK Research and Innovation cf. approx. US$35,000

6. Professor Tonny Oyana (PI), SIDA-DICTS Project No. 381: Integrating ICT based support in research, teaching and innovations 2018/19 worth 6 Billion UGX.

7. Rehema Baguma - 2019-2023- "Enhancing Quality and Internationalization of Study Programmes Through Mobile Transformative Pedagogy (EQIP)" by NORPART. (Co-PI with University of Agder, Norway, University of Rwanda and Paul Muyinda from the College of Education and External Studies-CEES).

8. Mutembesa Daniel, Data Science and Artificial Intelligence Lab, Incentives on scale, mechanisms for crowdsourcing with small-holder farmers, Facebook MD4SG Research Grant. US $50,000.

9. BRIGHT: Building Research Capacity in Innovative Information and Communication Technologies for Development (ICT4D) for Sustainable Socio-economic Growth in Uganda. This project is a collaboration between Chalmers University, University of Gothenburg, and Makerere University. This project supports ten PhD students. Researchers involved are: Associate Professor Engineer Bainomugisha (PI)/email contact: baino@cis.mak.ac.ug.

10. E-Services: Training for Sustainable Spatially Enabled E-Services Delivery in Uganda. This project is a collaboration between Lund University in Sweden, and Makerere University. This project supports six PhDs and two masters' students. Researchers involved are: Associate Professor Gilbert Maiga (PI)/email contact: gmaiga@cit.ac.ug.

11. KIPS: Building Capacity for Knowledge and Information Production and Sharing for Socio-economic Development in Uganda. This project is a collaboration between Swedish School of Library and Information Science, University of Borås, Sweden, and Makerere University. The project supports five academic staff doing their PhDs at Makerere University. Researchers involved are: Dr. George William Kiyingi (PI)/email contact: wkiyingi@gmail.com.

12. WIMEA-ICT: Improving Weather Information Management in East Africa for effective service provision through the application of suitable ICTs (www.wimea-ict.net). Dr. Julianne Sansa-Otim (PI)/email contact: sansa@cit.ac.ug. WIMEA-ICT is a combined research and capacity building project funded by the NORAD under the NORHED scheme. It is cooperation between Makerere University (coordinating institution), Dar-es-Salaam Institute of Technology (DIT), the University of Juba and the University of Bergen. This project was extended to December, 2020.

13. Dr. D. Jjingo and Dr. Florence Kivunike, NIH training grant US$ 1.25 m with CHS.

14. Dr. Ernest Mwebaze, Smartphone-based Crop Surveillance project (mCROPS), US$ 500,000, Bill and Melinda Gates Foundation.

15. Dr. Ernest Mwebaze, Scaled deployment of smart-phone agro-applications for field-based diagnosis and real-time surveillance data collection, US$ 76,000, PEER, NAS-NSF.
16. Dr. Engineer Bainomugisha, AirQo: Low-cost Air Pollution Monitoring, US$ 52,000, DIL/USAID.
17. Dr. Engineer Bainomugisha, SoCoMoT, Low-cost Internet of Things Technology for Soil Conditions Monitoring, US$ 80,000, UNCST.
18. Dr. Sarah Kaddu, EU grant (EU ICT H2020), €111775.00, Digitization of Cultural Heritage.
19. Ms. Fiona Ssozi, Gender-Just Digital Innovation in Africa (GeDIA), £882/£159,000 funded by Engineering and Physical Sciences Research Council(UKRI)

2.5 Publications

a) Books

1. Oyana T.J. 2020. Spatial Analysis with R: Statistics, Visualization, and Computational Methods. Second Edition, Taylor and Francis, CRC Press, Florida, USA.

b) Book chapters

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2. Oyana TJ, Kayendeke E, Adu-Prah S. (2019). Assessing Performance of Leaf Area Index in a Monitored Mountain Ecosystem on Mount Elgon-Uganda. In Environmental Information Systems: Concepts, Methodologies, Tools and Applications. Book Chapter. IGI Global Press Inc., Hershey, Pennsylvania.
3. Kabiito D. and Nakatumba J. -Nabende. Targeted Aspect-Based Sentiment Analysis for Ugandan Telecom Reviews from Twitter. Advances in Artificial Intelligence and Applied Cognitive Computing (Transactions in Computational Science and Computational Intelligence book series), Series No. 11769, Springer (2020).

c) Peer Reviewed Journal Articles

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2. Semwanga, A. R., & Atwine, A. M. (2020). Examining the Adoption of ICTs for Weather Monitoring and Climate Change Adaptation in Uganda. *International Journal of ICT Research in Africa and the Middle East (IJICTRAME), 9(1), 67-81.*
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3. RESEARCH DISSEMINATION, COMMUNITY ENGAGEMENT AND OUTREACH ACTIVITIES

1. WIMEA-ICT project carried out a tracer study with its alumni. The main objective was to evaluate short to medium term impact of the project on skilling students by tracking their employability status. Results from the study will be used to improve the training content and study conditions. And there was information sharing workshop held in July, 2020.

2. SIDA LIS international iConference-2020 on: *"Sustainable Digital Communities"* was held on 23rd to 27th March 2020 via zoom at the University of Boras.

3. Sensitization staff Workshop on new policy in Makerere of Anti-Sexual harassment was held on 8th February 2020.

4. The Department of Computer Science organized the MIT-Africa collaboration for impact workshop on educating with problem solving approaches held on January 20-21, 2020. The workshop was facilitated by Prof. Sive from MIT Africa.

5. EASLIS has partnerships with University of Boras. There is an International Student on Short Term Programme pursuing a Master of Science in Information Science, Semester II.

6. ICT Digital skills training for primary 7, senior four and senior six holiday makers took place in November, 2019 and January 2020.

7. STEM Workshop using gamification for primary schools was held in January, 2020.

8. EASLIS has partnerships with Kings College London, University of Boras in Sweden. The Swedish collaborators hold several meetings and the Annual review meeting was held on Monday 1st October 2019.

9. The RISE Directorate partnered with Clinton Health Access Initiative https://clintonhealthaccess.org): Under the guidance of the College Deputy Principal, the Grants Office participated in feedback meeting regarding their Graduate Training Programme which has taken on graduates from the Bachelor of Software Engineering. This is a budding opportunity for RISE to collaborate further with this initiative towards research and innovations.

11. MOU between Department of Computer Science and MTN Uganda: RISE supported the Department of Computer Science towards the signing of MOU between and Department of Computer Science regarding arrangements for establishing a closer linkage and collaboration between the two institutions to enhance practical skills development for Makerere University undergraduate students of Computer Science and Software Engineering.

12. The MOU Between Makerere University and Uganda National Meteorological Authority is supporting the NORAD funded project on 'Improving Weather Information Management in East Africa for effective service provision through the application of suitable ICTs (WIMEA-ICT)' to establish a 5-year Agreement regarding clearly stipulating the roles and responsibilities.

13. The chairperson of Council Ms. Lorna Magara visited the College on September 17, 2019

14. Hosted the Uganda Cisco Safari conference training instructors on new trends in networking in June 2019

15. Participated in the e-governance excellence awards expo sponsored by NITA-U in June 2019

16. Participated in the MIT-MAK Alliance (GSL Program) between CoCIS and CEDAT in July 2019.

17. The College officially launched the HUAWEI-ICT academy under CiPSD in July 2019.

18. CiPSD organized and trained the ISO police management team and ISO certified training UPF director forensics partnership between CFC and CoCIS in July 2019.

19. Bright summer school on software Engineering and IS at CoCIS in July 2019. This included grant writing, research and innovations training.

20. CoCIS organized a PhD and Masters research seminar in July and August, 2019 respectively.

21. CiPSD organized the SME training Get connected short course in August 2019.

22. The College successfully held an end of year party on Saturday December 14, 2019 at the Guest House, Makerere University.

4. FINANCE AND HUMAN RESOURCES

4.1 General Activities for the College 2019/2020

Vote	Code	Warrant	Payments	Funds Available	Percentage (%)
Allowances	211103	561,216,978	553,940,383	7,276,595	99
Advertising and Public Relations	221001	34,750,000	24,750,500	1,081,500	97
workshops and seminars	221002	15,000,000	14,923,500	76,500	99
Staff training	221003	138,900,000	46,195,725	82,025,275	41
Books, periodicals and newspapers	221007	5,700,000	1,206,000	4,494,000	21
Computer supplies and IT	221008	66,350,000	50,951,300	7,148,553	89
Welfare and entertainment	221009	97,800,000	73,040,040	20,941,960	79
Printing, Stationery, Photocopying and binding	221011	25,000,000	22,161,160	2,838,840	89
Subscriptions	221017	10,500,000	4,418,600	6,081,400	42
Telecommunications	222001	15,000,000	13,060,000	1,940,000	87
Postage and courier	222002	4,000,000	-	4,000,000	-
Guard and security Services	223004	16,500,000	7,165,850	9,334,150	43
Cleaning and sanitation	224004	50,000,000	6,943,020	38,566,980	23
Insurances	226001	2,500,000	-	2,500,000	-
Travel Inland	227001	22,310,000	10,190,000	12,120,000	46
Travel abroad	227002	82,750,000	28,571,355	26,576,147	68
Fuel, Lubricants and Oils	227004	20,000,000	480,000	2,520,000	87
Maintenance-vehicles	228002	20,000,000	2,112,075	17,887,925	11
Maintenance-Machinery, equipment	228003	23,510,000	-	23,510,000	-
Maintenance-other	228004	39,850,000	9,098,600	25,874,165	35
Scholarships and related costs	282103	224,650,000	173,418,600	35,881,960	84
TOTAL		**1,529,786,978**			

4.2 Human resources (new staff and promotions)

a) Department of Information Technology

1. Dr. Hawa Nyende successfully completed her PhD in Sweden under the Mak-Sida ICT project
2. Dr. Esther Namirembe graduated with a PhD in March, 2020.

b) Department of Networks

1. Dr. Benjamin Kanagwa was promoted to the rank of Associate Professor
2. Dr. Odongo Steven was promoted to the rank of Lecturer.
3. Dr. Hawa Nyende successfully completed her PhD in Sweden under the Mak-Sida ICT project
4. Dr. Rashidah Kasauli Namisanvu successfully completed her PhD in Sweden under the Mak-Sida ICT project
5. Dr. Mary Nsabagwa successfully completed her PhD.

c) Department of Computer Science

1. Dr. Rose Nakibuule successfully completed her PhD.
2. Dr. Michael Kizito successfully completed her PhD studies
3. Dr. Moses Ntanda was promoted to the rank of Lecturer

d) Department of Library and Information Science

1. Dr. George W. Kiyingi, a Senior Lecturer retired on 7th February 2020.

e) Department of Information systems

1. Mr. Mark Magumba successfully defended his PhD in December, 2019.

Dr. Rashida Kasauli Namisanvu
Department of Networks

Dr. Hawa Nyende
Department of Networks

Dr. Michael Kizito
Department of Computer science

Dr. Mary Nsabagwa
Department of Networks

4.3 Infrastructure

1. EASLIS building is pending renovations. The contractor is awaiting a contract renewal considering the contract period for the renovations expired during the lockdown. Block A renovations were completed.
2. Block A, B, EASLIS has leaking roof in the library, and the Dean's Office.
3. Service providers are facing a challenge of payments for services provided. A major concern is the Giant cleaning services responsible for maintaining cleanliness at the College.

4.4 Laboratory improvements (New equipment)

- 10 computers were bought in the students' laboratory effective Semester 1, 2019/2020.
- A multipurpose printer for the staff was delivered on 12th March 2020.
- Office chairs for five (5) Heads of Departments were delivered on 12th March 2020.

4.5 Students support services including library and teaching aids

- Library and teaching aids are still inadequate for the students.

4.6 Budgetary changes/ requirements

Currently, the School has three major needs.

1. Having Guest lecturers from the industry and graduate career talks for the students.
2. Recruit Graduate fellows attached to each department and organize monthly Graduate research seminar series to review progress and receive/provide feedback
3. Industry engagement on impact on COVID-19 on RAM and LIS.

4.7 Challenges

1. Administrative staff, in the College are understaffed in that the few administrative staff on ground are over stretched. Much as they handle their duties well, often the college has had to abruptly re-deploy them in units outside their official designations as a stop gap measure for continuity of college/university activities.

5. OTHER SUPPORT FUNCTIONS AND PROFESSIONAL SKILLS DEVELOPMENT

5.1 The College Registry Department

(a) Enrollment and Registration Statistics for Semester I & Semester II Academic Year 2019/2020.

SN	SCHOOL	SEMESTER	ENROLMENT	REGISTERED	REG %	PENDING
1	EASLIS	I	1,180	1,101		
	SCIT	I	1,854	1,631		
	Column totals		**3,034**	**2,732**	**90%**	**10%**
2	EASLIS	II	1,060	945		
	SCIT	II	1,611	1,314		
	Column totals		**2,671**	**2,259**	**84%**	**16%**

NB.
i.   Semester I enrolment and registration figures are usually higher than for Semester II.
ii. Semester II enrolment and registration figures were impacted by Covid-19 pandemic with several students opting to withdraw due to financial constraints.
iii. The above figures were generated on November 9th 2020.

1. The registry updated registration records of students in preparation for the end-of-Semester. University examinations commenced on November 16th, 2020 initially for the Finalist students. The Unit ordered for 20,000 blank examination booklets for the Semester II examinations which run into the third week of December 2020 for the rest of continuing students.
2. The start date for the 2020/2021 Intake was re-scheduled following the interruption of the normal Academic Year cycle for 2020 due to the Covid-19 pandemic. The Unit has neither received the lists of admitted students to the Undergraduate nor Graduate Programmes of study.

(b) Digital and Manual Records Management Systems

1. The transition from Academic Records Management System (ARIS) to Academic Information Management System (AIMS) posed several challenges. The most affected have been the Teaching Staff who have experienced difficulties in uploading results.
2. Students experience difficulties with enrolment and errors arising from wrong entries have to be rectified by the College Registrar in liaison with the College Bursar. The department therefore handles a multitude of cases as end-of-Semester examinations draw near.
3. AIMS has very significantly enhanced service delivery in the Unit however, the existing desktop Computers are out dated and have very limited memory space.
4. The Registry Section which stores the Manual students' records is full to capacity. The registry department is in the process of archiving the older files in order to create space for active and current files.

(c) Staffing

Staffing is lean but functional. All former Staff in the Unit serving on contract terms have left and no hand-over report was submitted by them. Currently the following positions are filled:

(i)   College Registrar.
(ii) School Registrar – EASLIS

(iii) School Registrar – SCIT
(iv) Records Officer.
(v) Messenger/Cleaner.

NB. 1. The late Mathias Angurini (Messenger/ Cleaner) was replaced by Ms. Rehemah Nalwadda.
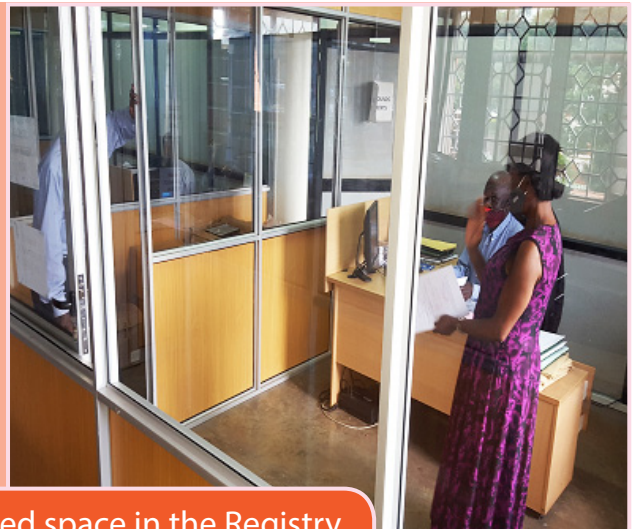
(d) Office Equipment and Furniture

1. The 5 desktop Computers in the Unit are over 6 years old. They have slowed down considerably and frequently need the attention of the technicians. They need to be replaced urgently.
2. The Unit has a new Color LaserJet Enterprise M750 Printer which is in top condition.
3. The Unit will need a scanner machine and a small photocopier to ease work.
4. Shutters of the in-built wall units need to be repaired as well although they provide breeding spaces for vermin that destroy paper records.

5. Office desks, Office Chairs and Cabinets all need to be replaced in a phased manner. Following the partitioning of the office space, there is need for at least 2 waiting benches.

(e) Physical Infrastructure

1. During the period of closure (March – August 2020), Block B was given a fresh coat of paint in the Lecture Rooms, Labs, Corridors and Registrar's Office. Also, the washrooms were refurbished however, the plumbing system and urinal sections are yet to be fixed.
2. The Registrar's Office was partitioned into 5 individual offices and 1 reception foyer. There is now a semblance of order and enhanced security of office records/equipment which was previously lacking.

Images of the partitioned space in the Registry department at Block B, Level 3, College of Computing and Information Sciences

5.2 Department of ICT Support Services

1. The Department of ICT and Support Services (DISS) staff manages College's computing facilities which include three local area networks and wireless access points. Our computing infrastructure consists of three student labs with 462 computers, projectors (instructional technology), printers, computer network inventory and 104 computers for the Center for Innovations and Professional Skills Development (CIPSD).
2. This unit also manages various online applications like a college inventory management system, library management information system(s) and the college timetabling system.
3. The unit also administers and maintains student and staff email addresses, as well as, mailing lists.
4. It also offers end-user support to approximately 4000 students, and about 120 members of staff.
5. The unit additionally plays a key role in revenue generation in terms of renting out the computer labs to the public to run various online assessment exercises.

5.2.1 Accomplishments

1. The Unit upgraded the following sections of the network
   a. COCIS < > DICTS with deployment of a powerful Nexus switch now running a capacity of 10G between the College and the University network
   b. Block A Level 4 <> DICTS with the deployment of the CISCO 3850 series switch with optional modules to run 10G
   c. Block A Level 3 <> DICTS with the deployment of the CISCO 3850 series switch with optional modules to run 10G
   d. Extension of fiber network (3 new segments) from the data center in Block B to Level 3 research Labs (WIMEA and Software Center) and to the AI Lab
2. The Unit cleaned up the Block A network eliminating a number of redundant links and devices which would later be deployed in Block B and EASLIS
3. The College data center was also cleaned up with only the operational devices powered and working optimally.
4. Supported tax training of over 300 students from the College of Business & Management Sciences
5. Provide ICT support to Uganda Revenue Authority in conducting their online recruitment activities of over 8000 participants under the recent framework contract.

5.2.2 Challenges

1. The Unit has only three assistant system administrators taking on extra roles such as is in support and network administration, but are on short term contracts which has continually decreased the working morale. The payments to the team are also usually delayed and this greatly affects their day-to-day operations.
2. External training of the unit staff members limited by funding and contractual issues that should be sorted
3. No working contracts with service providers such as in servicing of the data center air conditioners, printers, network switches and projectors.

6. THE CENTER FOR INNOVATIONS AND PROFESSIONAL SKILLS DEVELOPMENT (CIPSD)

Unit Name	Centre for Innovations and Professional Skills Development	Unit Acronym	CiPSD
Reporting Period	July-October, 2019		
Annual Budget	780,863,600	Disbursement at End of Reporting Period	
Unit Head Barbara Nalubega		Phone	0392000180
		Email	psd@cit.ac.ug, psd@cis.mak.ac.ug
		Fax	

6.1 Unit Objectives

a. Provide IT professional training with emphasis on imparting workplace skills
b. Provide linkage of College to the public and private sectors through innovation activities
c. The College runs a Center for Innovations and Professional Skills Development (CiPSD), through which the College addresses various industrial challenges like skills development, incubation of new ideas and nurturing of new technology-based business.

6.2 College and Huawei Inc. Partnership

2020 Accomplishments

1. The Unit received equipment worth USD 30,000 in a colourful ceremony held at the College and presided over by Dr. Mugisa the new Managing director of NITA -U.

HUAWEI team and Guest of Honor pay a courtesy call to the Vice

HUAWEI team handing over equipment to the Center

2. Amity income from continuing students stands at 96,573,301.
3. Huawei is processing payment worth 15,000 Us dollars as funding for Centre operations
4. The unit also received Networking equipment (Switches and Routers) worth USD 100,000 from the Cisco networking Academy Management in Europe.

CiPSD Staff displaying equipment received from Cisco

Students observing social distancing during a lecturer

5. We received USD 11,500 from Silicon Valley in the USA to teach Cyber Security and improve digital Skilling as well as bring new academies on board. The funds have birthed new partnership and collaboration opportunities:

   i) Successfully opened two new Cisco academies: CTEN in Northern Uganda and Rowosa in Bombo Barracks and trained their instructors in the IT Essentials Course. The academies had opened up and enrolled students but didn't teach due to the COVID-19 19 interruption.
   ii) We partnered with the Uganda Tailors' association and trained 177 youths in the Get connected course.
   iii) We partnered with the school of Gender and women studies and taught 120 students in Cyber Security Operations.
   iv) We partnered with Bugema University and Uganda Christian University (UCU) and trained 34 students and 44 in cyber security respectively.
   v) In partnership with Kampala International University as a team, CoCIS trained a total of 3,537 in digital skills.

6. We administered the Cyber security exams to the previous Mastercard Cohort 4 stellar performers in ICDL
7. Amity University continuing students are doing well and we have a total of 179 students on bachelor's degree and master's degree Programmes.

8. The center purchased new projectors for the laboratories. 2019 Accomplishments

   1. After we signed an MOU in May 2019, we organized 7 training classes from June to April in Makerere university, over 400 students were trained for free and 240 students got certified.
   2. Following this training, we organized a job fair for ICT students in September and Huawei offered them 20 internships.
   3. In August 2019, we organized the first ICT Academy Roadshow in Makerere university and over 300 students registered for the ICT Academy Competition.
   4. From September to November, we are focused on ICT Academy Competition Roadshow (other universities) and online training for registered students.

5. From 9th December to 15th December 2019, we organized boot camp for the Top 100 students from ICT Academy Competition preliminary examinations
6. We held the National exam in Huawei office on 28th December 2019.
7. Top 3 students from Makerere university were selected to go South Africa for regional exam in March 2020.

University	Name	Phone	Email address	Full score
Makerere University	Magola Kenneth	0703927362	magoolakenneth@gmail.com	614.4
Makerere University	Okello Stephen	0789525422	okellostephen747@gmail.com	539.2
Makerere University	Mudulo Gerald	0751639629	geraldmudulo@outlook.com	511.2

6.3 Challenges & Way Forward

Activities and outputs for 2019/2020				
Planned Activities	**Key Tasks**	**Outputs**	**Budget**	**Responsibility**
Visit secondary schools especially in the Wakiso Area	Marketing	Increased student enrolment	2,000,000	Business Development Officer and CIPSD team
Vigorously engage in digital Marketing and radio ads	Marketing	Increased student enrolment	10,000,000	CIPSD staff
PC hardware training	Training HIGH schools	Improving upon and Increasing digital literacy and numbers in the Cisco program		CiPSD staff
ICT youth digital awareness	Marketing	Increasing digital literacy	10,000,000	CIPSD staff
Training of staff from the DICTS in advanced Cyber security	Training cyber-Security	Improving security skills of employees in DICTS	20,350,000	CIPSD staff
Cisco Instructor Training at UCU	**CCNA training**	**Improving Instructor' professionalism and revenue base for the college**	**USD 1,650**	CiPSD staff
Mastercard Foundation Scholars Training	ICT Training	Proposal to train 430 scholars submitted to MasterCard	320,154,000	CiPSD Staff, MasterCard scholars and Department of planning staff
		Subtotal	34,350,000	34,350,000
Administrative costs (staff costs, office operating costs and governance costs)				
			Grand Total	**360,154,000**

Planned Activities	Key Tasks	Outputs	Budget	Responsibility
Visit secondary schools especially	Marketing	Increased student enrolment	2,000,000	Business Development Officer and CIPSD team
Vigorously engage in digital Marketing and radio ads	Marketing	Increased student enrolment	10,000,000	CIPSD team
Continue training Huawei courses online and later introduce students to the new Huawei equipment	Marketing	Increased student enrolment	10,000,000	CIPSD team
Huawei Training and setting up the Huawei lab	Training in cloud computing and HCIA R&S	Receive funding from Huawei	USD 15,000	CIPSD staff.
Bringing TOEFL on board to step up income in the testing Centre is the new initiative we are pursuing				CiPSD staff
Send out proposals to churches and institutions such as banks to train their clients and staff respectively			20,000,000	CIPSD Staff

6.5 Budgetary activities, changes/ requirements

Activity/course	Training	Numbers	Numbers	Planned	Actual	Comments
Cisco Cyber Security / and digital literacy training programme using grant money	Cisco IT ESSENTIALS training programme for 4000 high schools in Kampala, Jinja and Mukono and ROWOSA using the Cisco- IT Essentials curriculum	4,000 applicants to be trained by COCIS in collaboration with KIU, UCU, ROWOSA, School of Gender and Women studies MUK.	3537 applicants have so far so been trained by KIU and CoCIS A total of 255 have been trained on the Cyber security course by the other partner academies & the tailors association	$ 11,500	$ 11,500	500 students are pending assessment Once schools open, they will be assessed

Cisco Cyber Security / and digital literacy training programme using grant money	Cisco IT ESSENTIALS training programme for 4000 high schools in Kampala, Jinja and Mukono and ROWOSA using the Cisco- IT Essentials curriculum	4,000 applicants to be trained by COCIS in collaboration with KIU, UCU, ROWOSA, School of Gender and Women studies MUK.	3537 applicants have so far so been trained by KIU and CoCIS A total of 255 have been trained on the Cyber security course by the other partner academies & the tailors association	$ 11,500	$ 11,500	500 students are pending assessment Once schools open, they will be assessed
Short courses Training	Training various short professional courses in the Center (CCNA, CCNP, CCA, IT essentials, ICDL, IC3, Oracle, Graphics and image Editing etc)			UGX 330,000,000	$ 11,500	Due to COVID-19 pandemic that led to closure of the University studies were interrupted but studies have resumed.
UCU instructors training	Training of 6 instructors	6	1,650	1,650		Instructors trained
Master card training cohort 5	Training of 263 students has commenced with administering a survey tool to establish competence levels of the cohort Cyber Security Ops, CCNP, GMAT, MCSE	The Training is in IC3 Digital literacy – It is a globally recognised training leading to certification	The number to be trained is 263 via zoom	The amount is USD 52,800	USD 52,800	Training is on going
Amity Makerere –MOU Implementation	Continuation of students who are on several Post graduate Diplomas, Degree programs and Master's programs	We planned for about 200 students Per semester for all the remaining intakes to continue successfully	We have remitted fees for about this semester (and so far, we have 179 continuing students	76,573,600	NB: The Amity Income from continuing students has been at UGX 79,969,363	Good performance but this Program is winding up and will be transferred to EVBAB project.

Huawei ICT Academy	Trained over 500 students and 200 certified	500 certified	200 certified	USD 15,000	USD 15,000	
ISO collaboration	ISO standards training started but were staggering in terms of numbers	Planned for about 50 participants from the public and private sectors			N/A	Program suffered the COVID-19 Pandemic and is yet to recover.

6.6 Progress with Strategic Planning

• CNA 6.0 has changed to CCNA Version 7
• CCNP has evolved into two: CCNP Enterprise and advanced Routing
• Linux has evolved into DG LINUX

6.7 Innovations in teaching and learning

• Bringing TOEFL on board to step up income in the testing centre is the new initiative we are pursuing.
• Since training was not successful through use of only the online model via zoom for all the Cisco programs, we decided to blend it; live and Physical use of equipment classes have resumed with SOPS in place.
• Amity MOU continuing students have paid a substantial amount of fees and their studies for a new semester have resumed.

6.8 Program impacts on society

• Tailors were digitally skilled in the Get connected course free of charge.
• High school students were digitally skilled in CCNA, ITE, and cyber security courses free of charge with funding support from Cisco Networking Academy.
• Sister Universities with networking academies like Bugema University, Kampala International University and UCU rely on our expertise and get free skills courtesy of our partnership with the Cisco networking Academy –EMEAR.
• Implementing the E-VBAB project has already started benefiting a total of 305 Uganda students from the Industry.

6.9 Collaboration

• We are implementing the MOU signed between the Government of India and that of Uganda to have a select few Indian institutions operationalise the E-VBAB project. The start has been very challenging but we hope to settle in the next few months; So far, a total of 305 students have been admitted and studies have commenced.

6.10 Support functions and Administrative Changes

a) Staffing

• Our staff were reduced by one person who left during the COVID-19 pandemic and Instructors have taken on her duties in turns and two staff were recertified and retooling in CCNA and CCNP Qualifications.

b) Laboratory improvements (New equipment)

• Three New projectors were procured for the laboratories under the Department of ICT Support services.

7. RESEARCH HIGHLIGHTS

This year the College is highlighting two research projects. The recent concluded Weather Information Management System for the East African Region and Air quality monitoring project funded by Google.

7.1 WIMEA-ICT Project: Improving Weather Information Management in East Africa for effective service provision through the application of suitable ICTs

The WIMEA-ICT project was launched in November 2013, with an aim to improve the accuracy of and access to weather information by the communities in the East African region through suitable ICTs for increased productivity in the agricultural sector, water resources and environment, disaster management, health, fisheries and aviation sectors.

The project has held its activities in 5 partner institutions, namely: Makerere University, Uganda (project leader); Dar es Salaam Institute of Technology, Tanzania; University of Juba, South Sudan; and University of Bergen, Norway.

WIMEA-ICT team

Highlights from the project's components and main activities:

i. Validation of the Numerical Data

- The (NWP) model has been adopted by the Uganda National Meteorological Authority, by which current observations of weather are processed with computer models for future weather predictions. A validation exercise was done at the benchmarking workshop held in July 2020
- Training was carried out for UNMA personnel in high resolution and tailored climate modelling for high impact climate studies, and findings presented to partner countries.

ii. Improved density of the Weather Station network

- Low-cost Automatic Weather Stations (AWS) have been deployed (11 in Central and Eastern Uganda and 6 in Dar es Salaam), with data transmission to a central server (UNMA server in Uganda and TMA server in Tanzania).
- A benchmarking workshop was held in July 2020, to present the hardware and software of the WIMEA-ICT AWS, to get crucial feedback from the stakeholders as experts in the field and to develop a framework for testing the performance of the AWS in all partner countries.

iii. Continued training on the Weather Data Repository

• The Weather Data Repository (WDR) has been adopted by UNMA and further training given to the technical personnel. The WDR provides real time weather data generated by the Numerical Weather Prediction Model to facilitate weather forecasting/climate modelling. Under the existing Memorandum of Understanding the relationship with UNMA has been strengthened.

iv. Further development and launch of the Weather Information Dissemination System (WIDS)

• The Weather Information Dissemination System (WIDS) was developed over a 3-year period to Improve/automate decentralized weather information dissemination for different stakeholder groups. It is available via a simple phone (*255*85#) and the web system (http://wids.mak.ac.ug/wids).

• A publicity campaign was carried out in February and March 2020. A team of marketing students participated in agricultural shows before the lockdown. Radio talk shows, audio announcements, social media and newspaper articles all helped to boost the usage of the system.

• There has been customization at country level into 9 local languages, with access to translated forecasts granted by World Vision.

• WIDS was officially launched on 28th August, 2020 by the Minister of ICT and National guidance and has been embraced by the public (mostly farmers), registering more than 8,538 users currently. The attendance at the launch proved that WIMEA-ICT has taken a major stride in engaging stakeholders.

v. Capacity building by research and teaching

• Undergraduate and post graduate Programs - The project has registered 4 PhD graduates this year, and 2 others are in their final stages; several Masters students, Bachelors students and interns.

• A tracer study was carried out in May 2020 to assess the value of the research and training activities undertaken, to both the employers and the alumni in Meteorology, Information Systems, Computer Engineering and Software Engineering. The additional required skills identified – both discipline-specific and soft skills – will be included in academic programs.

• Training of technical personnel – WIMEA-ICT team held training workshops to further equip UNMA staff in Numerical Weather Prediction and the Weather Data Repository. Various stakeholder groups were also trained in the usage of the Weather Information Dissemination System.

Deo Okedi, a student intern, demonstrates to the NORAD team how the AWS works

WIMEA-ICT team at the installed AWS station at University of Juba in South Sudan

7.2 AirQo Project: Using low-cost technologies and AI to close the gaps in air quality data

- With a vision to enhance clean air for all African Cities, the AirQo project is using low-cost technologies and artificial intelligence to close the gaps in air quality data in Uganda and across sub- Saharan Africa. Led by Professor Engineer Bainomugisha, an Associate Professor of Computer Science and the Chair of the Department of Computer Science at Makerere University, AirQo believes that the first step in being able to improve ambient air quality across is being able to measure the air quality and know what the current levels of pollution are.

- Air pollution contributes to over 7 million premature deaths annually and WHO estimates that over 80% of populations in monitored urban centers are exposed to ambient pollution levels above WHO guideline levels. In Uganda, ambient air quality levels in monitored urban centers are estimated at over 5 times the WHO annual guidelines and over 30,000 people die annually due to air pollution-related illnesses, and yet there is still limited capacity for effective management and interventions to mitigate air pollution.

- AirQo has developed and deployed over 90 low-cost air quality monitoring devices in different urban areas across Uganda. These are locally designed and manufactured at the software systems lab at the College.

- Although 2020 has been quite an indelible year, AirQo did have a fair share of success stories and are thankful for all that the team has accomplished.

i. AirQo Launch in Uganda

AirQo was officially launched on 26th Feb 2020 at Sheraton Hotel, Kampala under the theme, 'Know Your Air', to officially introduce the project to its relevant stakeholders including; key government institutions, academic establishments, private sector, civil society organisations, foreign and diplomatic missions, and the general public. Most importantly, the launch was intended as a major platform to stimulate debate on air quality and potentially highlight some of the intervention strategies and initiatives to improve air quality in Uganda. The pictures below display the launch of the AirQo project in Uganda. The Guest of Honor was Hon. Judith Nabakooba, Minister for Information and Communications Technology.

ii. Scaling AirQo's work

- In May 2019, AirQo was announced as one of the 20 winners of the Google AI Impact Challenge selected from over 2600 applicants and received a grant of $1.3m. With this grant, the project has been able to scale up its air quality monitoring scope from Kampala to over other regions across Uganda. AirQo has also Installed 2 Reference Monitors for calibration purposes to ensure accuracy of data collected from its low-cost monitors.

- AirQo has also been able to develop computing and analytics capabilities to support air quality dissemination. Through the AirQo App, users are able to access real-time, historic and forecast air quality data to empower them with information to minimize their exposure to dangerous pollutants.

- AirQo has developed an analytics platform that enables users to access large data sets in simple customizable report formats. This is currently being used by Kampala Capital City Authority. The AirQo team illustrates the use of their air quality monitor, installing a monitor on a site in kampala and a boda-boda rider with an installed air quality monitor respectively in the pictures below

- **The AirQo team demonstrates the use of their air quality monitor (1), installing a monitor on a site in Kampala (2) and a boda-boda rider with an installed air quality monitor (3) respectively**

iii. Policy and ongoing collaborations

- AirQo are lead authors of the first ever chapter on air quality in the National State of the Environment Report (NSOER) 2018/2019. The NSOER is a statutory obligation produced biennially to inform the public about the state of the environment in the country, the importance of the environment and natural resources in the development process while highlighting trends and projections, key challenges and opportunities for improvement. AirQo contributed air quality monitoring data and reported on the status of air quality for the reporting period considered. This is the first-time air quality is featured in the NSOER

- Led policy research program on Pollution Management and Cities Competitiveness for Kampala in collaboration with the World Bank. AirQo was part of this collaborative research from 2018 to 2020 and provided empirical primary data to support this multi-year research which aimed to: generate information and knowledge for cities and national level decision makers in urban planning and economic competitiveness; increase understanding and capacity among pollution related decision makers; and produce outputs and tools to support policy makers in managing both pollution and competitiveness. Key insights were presented during the stakeholder dissemination workshops in July 2020.

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REALIZING OUTCOMES FROM OUR PRO-GROWTH ACADEMIC MEASURES AND ACTIONS

ANNUAL REPORT 2019/20