

Enhancing Research and Graduate Training

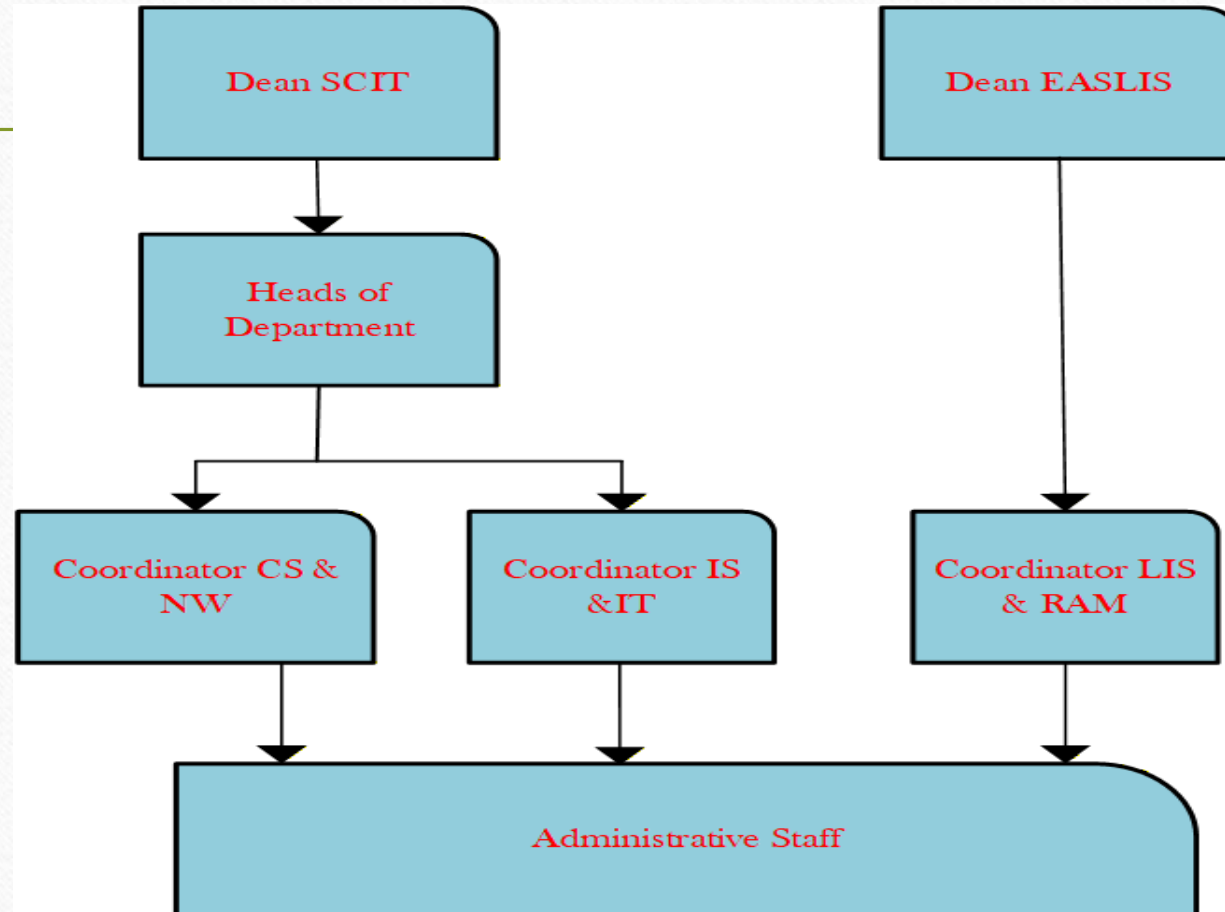
Status of Research Management and Graduate Studies
Excellence at COCIS

Prof. Tonny Oyana

Overview of CoCIS Research Status

- At CoCIS, we are dedicated to achieving excellence in graduate training by effectively managing our programs to enhance their quality, efficiency, and overall impact.
- Our commitment focuses on implementing innovative research strategies and continuous improvement efforts to ensure that our graduate students receive the highest standards of education and research opportunities.
- Through this dedicated approach, CoCIS aims to cultivate skilled professionals who are well-equipped to make meaningful contributions to their fields and society.

CoCIS Research Structure

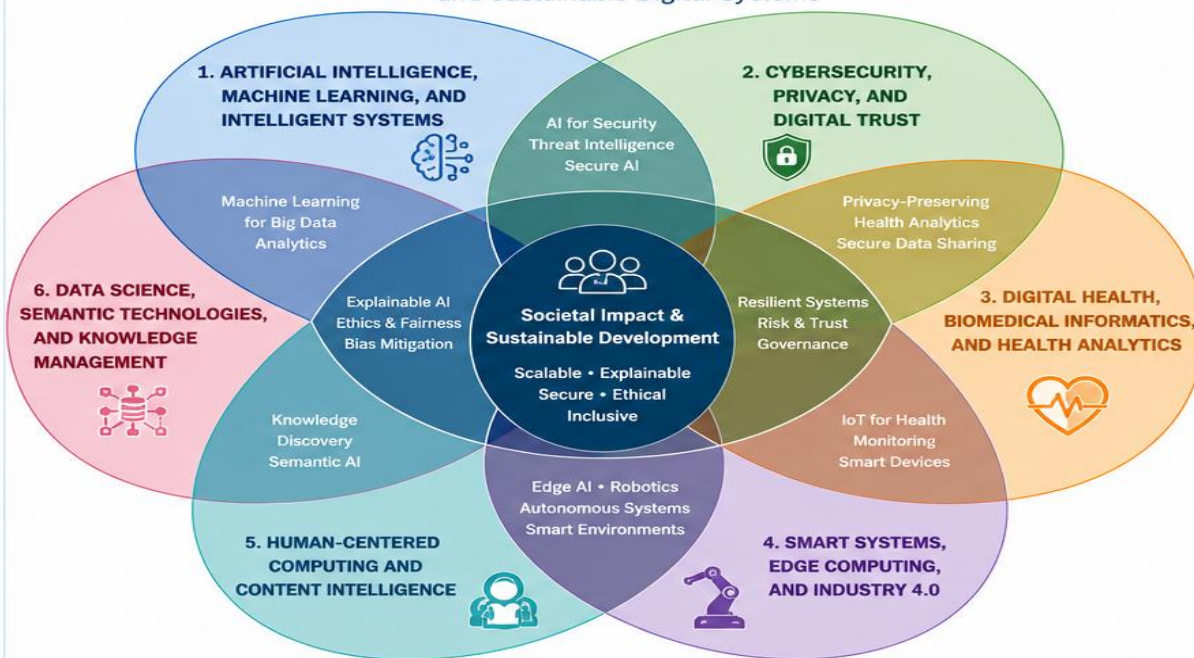


17 Graduate programs offered: Master's, PhDs, Post graduate Diplomas

- Master of Science in Computer Science
- Master of Science in Information Sciences
- Masters in information Technology
- Masters in Data communication and software engineering
- Masters in e-governance Technologies and Services (new)
- Master of Science in Information Science
- Master of Science in Records and Archives Management
- Post graduate Diploma in Computer Science
- Post graduate Diploma in Data Com and Software engineering
- Postgraduate Diploma in Information Technology
- Postgraduate Diploma in information Systems
- PhD in Software Engineering
- PhD in Information Systems
- PhD in Computer Science
- PhD in Information Technology
- PhD in Information Science
- PhD in Records and Archives Management

INTERSECTING RESEARCH AREAS

A Convergent Research Agenda for Intelligent, Secure, Human-Centered and Sustainable Digital Systems



CONSOLIDATED RESEARCH AGENDA – SIX STRATEGIC PILLARS

UNIQUE CONTRIBUTIONS OF EACH RESEARCH AREA

- AI, ML & Intelligent Systems**
 - Deep Learning & Predictive Modeling
 - Computer Vision & NLP
 - Intelligent Decision Support
 - Smart Automation
- Cybersecurity & Digital Trust**
 - Threat Detection & Response
 - Privacy-Preserving ML
 - Digital Forensics & Biometrics
 - Secure Systems & Cloud Security
- Digital Health & Health Informatics**
 - AI for Diagnosis & Prognosis
 - Wearable & Remote Monitoring
 - Mental Health & Patient Safety
 - Population Health Surveillance
- Smart Systems & Industry 4.0**
 - Robotics & Autonomous Systems
 - IoT & Edge Computing
 - Remote Sensing & Geospatial
 - Smart Manufacturing & Monitoring
- Human-Centered Computing**
 - Usability & Human-AI Interaction
 - Explainable & Trustworthy AI
 - Digital Inclusion & Accessibility
 - Content Intelligence
- Data Science & Knowledge Management**
 - Big Data Analytics & Visualization
 - Semantic Web & Ontologies
 - Knowledge Discovery & Mining
 - Data Governance & Quality

CROSS-CUTTING THEMES (ACROSS ALL AREAS)

- Ethics, Responsible AI & Governance**
Fairness, Accountability, Transparency
- Privacy & Data Protection**
Data Privacy, Anonymization, Consent Management
- Sustainability & Societal Impact**
SDGs Alignment, Climate Resilience, Community Impact
- Human-Centered & Inclusive Design**
Accessibility, Equity, User Empowerment
- Emerging Technologies**
Edge AI, 5G/6G, Quantum Computing, Digital Twins
- Policy, Regulation & Standards**
Digital Policy, Compliance, Interoperability

1. DIGITAL HEALTH, HEALTH INFORMATICS, & HEALTHCARE SYSTEMS

- AI in Healthcare
- Health Data & Analytics
- Telemedicine & mHealth
- Patient Safety & Outcomes

2. ARTIFICIAL INTELLIGENCE, DATA SCIENCE, & RESPONSIBLE AI

- Machine Learning & Deep Learning
- Data Analytics & Big Data
- Explainable & Trustworthy AI
- AI Ethics & Governance

3. DIGITAL TRANSFORMATION, E-GOVERNMENT, & PUBLIC SECTOR INNOVATION

- E-Government Services
- Digital Platforms & Smart Cities
- Open Data & Transparency
- Policy & Innovation

4. KNOWLEDGE MANAGEMENT, ENTERPRISE SYSTEMS, & DECISION SUPPORT

- Enterprise Information Systems
- Knowledge Sharing & Ontologies
- Decision Support Systems
- Business Intelligence

5. SMART AGRICULTURE, ENVIRONMENTAL INFORMATICS, & SUSTAINABLE DEVELOPMENT

- Precision Agriculture
- Remote Sensing & GIS
- Environmental Monitoring
- Food Security & Sustainability

6. HUMAN-CENTERED COMPUTING, EMERGING TECHNOLOGIES, & DIGITAL INCLUSION

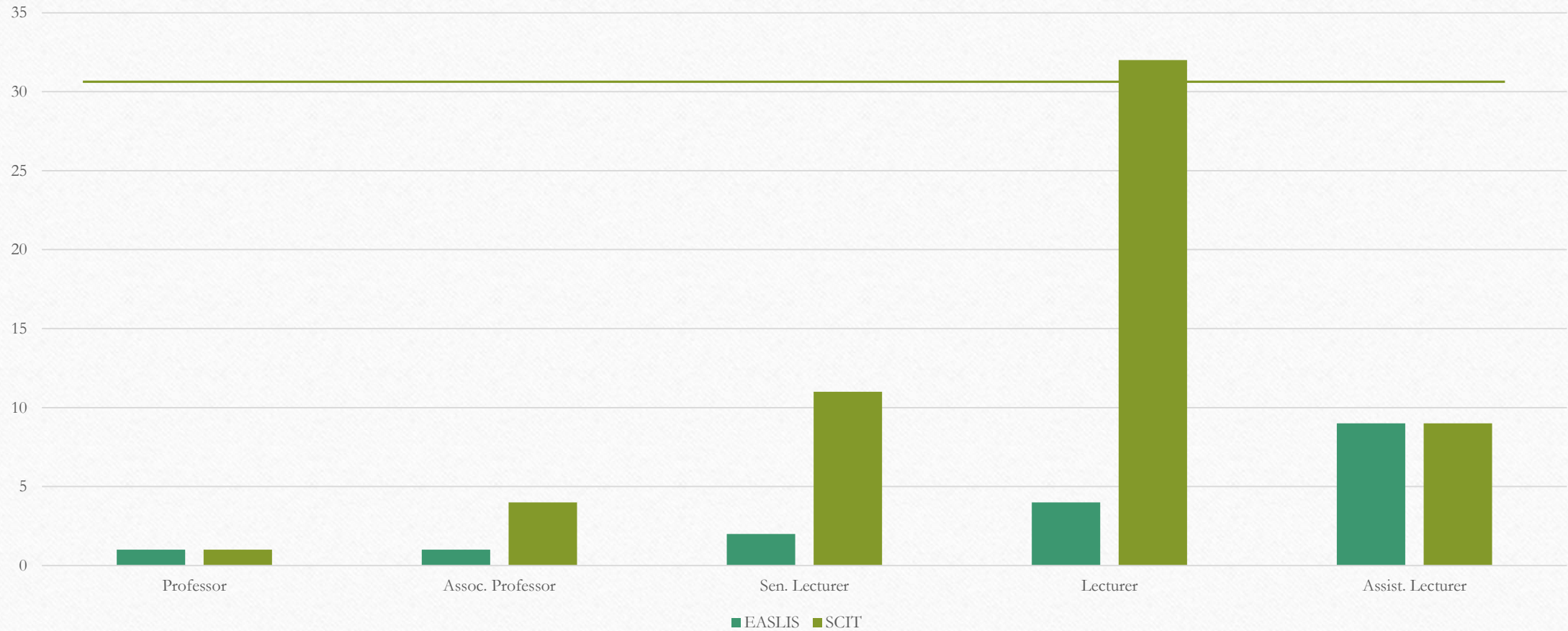
- Human-AI Interaction
- Emerging Tech (IoT, Blockchain, XR)
- Digital Inclusion & Accessibility
- Community & Capacity Building

ENABLING FOUNDATIONS (ACROSS ALL PILLARS)

- Data Infrastructure & Cloud Platforms
- Computing Systems & Networks
- Software Engineering & Quality Assurance
- Security by Design & Resilience
- Interdisciplinary Collaboration & Partnerships

An example of SCIT Research Agenda, EASLIS also has their agenda.

Academic Staff & Research Capacity



Graduate Training Structures at CoCIS

The graduate training structure and research activities at College of Computing and Information Sciences (CoCIS) are organized through key units.

- **Graduate Research Office:** This office oversees all graduate research activities, providing support, coordination, and administration for graduate students and faculty involved in research.
- **Seed Funding through RISE:** Graduate students benefit from funding opportunities provided by the Research Innovation and Skills Enhancement (RISE) program, which supports research projects, conference participation, and other academic pursuits.

- **Graduate Coordinators:**

EASLIS (East African School of Library and Information Sciences) Has a dedicated graduate coordinator responsible for department-level supervision, advising, and support of graduate students.

SCIT (School of Computing and Informatics Technology) also two graduate coordinators representing different departments, ensuring tailored support and oversight for graduate students within SCIT

This structure aims to facilitate effective graduate training, research support, and academic development across both schools within CoCIS.

Activities of Graduate Research Office at CoCIS

- The Graduate Research Office is committed to supporting and enhancing the academic journey of graduate students through effective coordination, administration, and
- academic support. The office operates under the leadership of the Dean, in collaboration with department heads, coordinators, and administrative officers.

1. Orientation and Student Support

- The office organizes comprehensive orientation sessions for incoming graduate students in collaboration with the Dean, College Registrar, and Department Heads.
- Students are provided with an overview of the graduate studies pathway, policies, and procedural guidelines, including examination, registration, and withdrawal policies.

2. Academic Seminars and Research Discussions

- Weekly seminars are always organized to facilitate scholarly discussion of students' research work.

- Lead discussants for each session are appointed—one for Master's students and one for PhD students—to foster peer review and constructive feedback.
- The office offers support towards the refinement of dissertations, theses, and research proposals prior to submission and defense.

3. Examination and Defense Management

- The office Schedules and organizes regular thesis and dissertation defenses, every six weeks.
- It manages the examination process, including dispatching papers to external examiners and following up on their evaluations.
- Collects, compiles, and disseminate examiner comments to students to prepare them for final defenses or viva voce examinations.

Activities of Graduate Research Office at CoCIS

- External Examiners Coordination
- Maintain an up-to-date database of external examiners, including their CVs and contact details.
- Facilitate communication with external examiners to ensure timely and effective evaluation processes.

5. Research Skills Development

- Organizes workshops and seminars focusing on essential research skills, such as research methodology and literature review techniques.
- Promotes continuous learning and capacity-building among graduate students.

6. Feedback and Continuous Improvement

- Conducts interactive meetings with students to gather insights into their challenges and needs.
- Uses feedback to improve administrative processes, academic support, and research activities.

7. Graduation Administration

- The office generates and maintain an accurate list of graduating students.
 - Coordinates graduation ceremonies and related administrative procedures to ensure a smooth graduation process.
- **Next are the Graduate graduation Statistics from 2010 to 2026**

Year	Graduate Programme											TOTAL
	PhDs	MSCS	MIT	MIS	MDCSE	MSIS	MSRAM	PGDCS	PGD IS	PGD IT	PGD SE	
2010	1	13	10	9	9							42
2011	2	5	6	6	17	4				1		41
2012	4	3	6	4	7	5						29
2013	3	9	9	9	11	8		1				50
2014	0	4	0	2	16	5			1			28
2015	1	11	12	25	26	6	0					81
2016	0	1	1	2	0	0						04
2017	0	2	21	19	17	17			1	1		78
2018	1		7	7	12	6		2	2			37
2019	1	8	4	3	8	6						30
2020	6	3	7	5	4	4				2		31
2021	5	13	2	5	5	8	1					39
2022	9	6	4	8		10	4					41
2023	7	5	4	4	5	6					2	33
2024	1	6	5	4	2	14	3					35
2025	12	14	8	15	10	15	10					84
2026	13	25	9	16	24	18	4					109
Total	66	128	115	143	173	132	22	3	4	4	2	792

Graduation Statistics Overview (2010–2026)

A visual summary of graduation trends by year and by course.



TOTAL GRADUATES

792



PEAK YEAR

2026
(109)



LOWEST YEAR

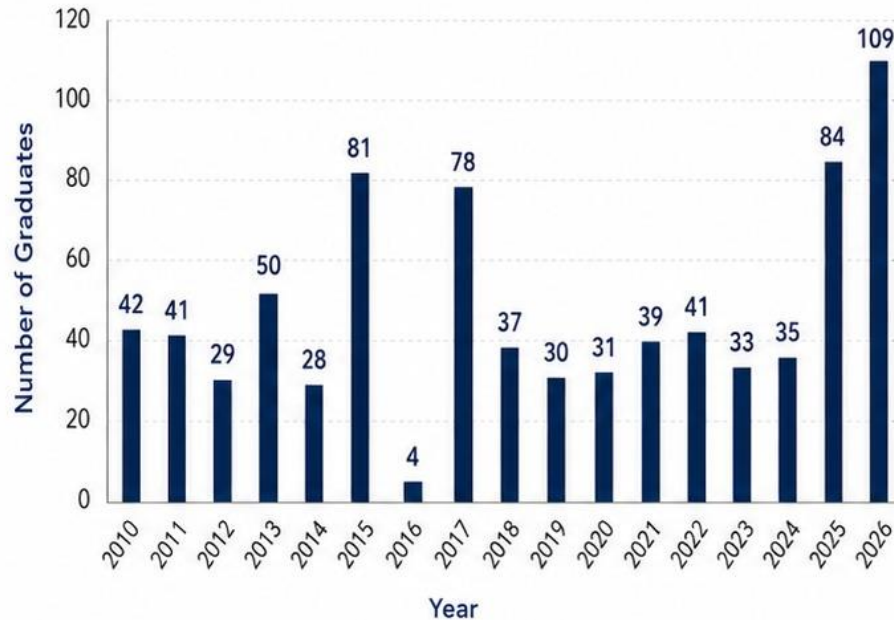
2016
(4)



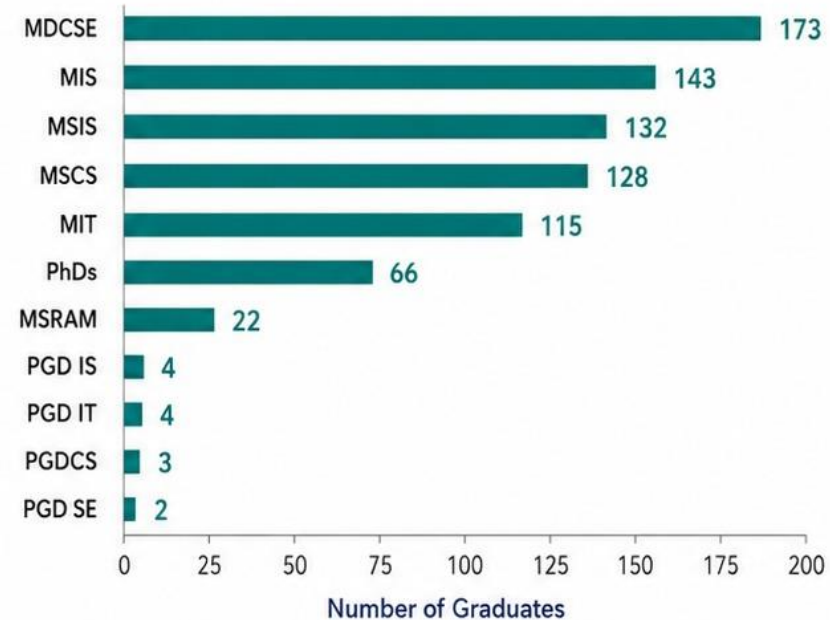
YEARS COVERED

17
(2010–2026)

GRADUATES BY YEAR



GRADUATES BY COURSE (TOTAL)



KEY TAKEAWAYS

1

Overall growth culminated in a record high of **109** graduates in 2026.

2

A sharp dip occurred in **2016**, with only **4** graduates.

3

MDCSE is the leading course overall with **173** graduates.

THE RISE INITIATIVE

- The Research and Innovation Services & Engagement (RISE) unit at CoCIS has significantly transformed the landscape of research and graduate studies by fostering a vibrant culture among students and staff.
- Since its establishment in 2018, RISE has provided a structured platform for funding, mentorship, and capacity building, encouraging interdisciplinary collaboration and innovative thinking.
- Through targeted grant calls, training workshops, and dissemination events, RISE has empowered graduate students to undertake impactful research projects, publish their findings, and secure follow-on funding.
- This support has not only elevated the quality of research outputs but also enhanced the practical skills of students, preparing them to become leaders and innovators in their respective fields

RISE and Research Labs

- RISE was established to promote research and innovation
- Facilitated many calls for staff and students, > 6 for staff and > 7 students
- Beneficiaries: 70+ student research groups which comprised 280 students, 50 academic staff
- The RISE Initiative has had an Indirect impact on 500+ through workshops and presentations
- Secured 11 follow-on grants from government and international funders
- Our Research labs lead in all our efforts to train and win research grants

Annual Seed Grant Awards Highlights from RISE

Year	Funded Proposals (Staff)	Funded Proposals (Student)	Administrative Costs and Other Activities	Total Funding
2018	0	12,900,000		12,900,000
2019	0	0	17,750,000	17,750,000
2020	85,000,000	5,000,000	9,800,000	99,800,000
2021	94,712,000	17,590,000	51,252,600	163,554,600
2022	30,000,000	9,000,000	55,732,200	94,732,200
2023	30,000,000	15,000,000	40,490,000	85,490,000
2024	120,000,000	51,000,000	70,495,000	241,495,000
2025	90,000,000	39,000,000	25,504,350	154,504,350
Total	449,712,000	149,490,000	271,024,150	870,226,150

Key Achievements and Research Impact

- Over 70 student research groups
- More than 12 Follow-on grants won and secured
- Increased research culture and innovation
- Strong industry and government partnerships
- Notable Projects with societal impact such as, Smart rural water system, Ugandan Sign Language Dictionary, AIRQO, AI for disease surveillance, telemedicine, Blockchain, traffic monitoring, health systems, Waste management, IoT for healthcare, AI for mobility, healthcare, education, IoT, AI risk assessment, and assisted learning

Constraints to Research Growth

- Competitive Research Funding
- Our Makerere University Grant structure doesn't provide solid support and infrastructure
- Need to increase strong research culture and innovation among young researchers
- RIF is helpful but doesn't support longer term efforts that tend build and nurture strong data and evidence that is able to attract large external support
- Low quality of research teams (preference to proceed on our own instead of basing capacity and capability) and outputs. High quality should be driven by robust scientific knowledge and viable partnerships.
- Embracing interdisciplinary/multidisciplinary research initiatives requires a real change in the reward system. Our current system embraces disciplines and singular thinking. Invisible tuff wars and individualist approaches persist; selfishness kills the need to operationalise concepts and doesn't correctly align with combined synergies.

Conclusion

- Build, support and trust research systems at College level
- Invest in young research cadres and build resilient networks
- Encourage and support high quality research teams
- Define and invest in core research areas that will magnify the vision and work of Makerere University as a renown R&D institution. Sometimes, higher risk research investment areas yield higher rewards in the long-term.
- Thank you to our CoCIS research stewardship for the amazing outputs.