

FACULTY OF SCIENCE & TECHNOLOGY

Year Ending July 31st, 2022

Dean



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Overview

The Faculty of Science and Technology consists of the Departments of Chemistry, Computing, Geography and Geology, Life Sciences, Mathematics, and Physics, the Biotechnology Centre, the Natural Products Institute (NPI), the Earthquake Unit, and the Mona Institute for Applied Sciences.

Rebuilding in the post-COVID Era

The Faculty of Science and Technology commenced the 2021/2022 academic year with a mandate to 'hold strain' in the midst of the COVID-19 pandemic, whilst beginning to lay foundations for faculty operations in the post-COVID era. The guiding vision remained "Becoming the Go-To place for Science Education, Training, Research and Solutions". The summary table below provides a quick overview of the faculty. The narrative that follows highlights initiatives undertaken during the year listed under the strategic operational headings of Teaching and Learning, Research, Outreach, Communication and Staff Engagement, and Finance.

Table 1: Overview of the faculty

AREAS	ACADEMIC YEAR	
	2021-2022	2020/21
Undergraduate Students	2475	2800
Postgraduate students	319	350
Undergraduate programmes (majors/minors)	46/22	46/22
Undergraduate degrees awarded (1 st class, U2 nd , L2 nd , P)	476 (177M 299F) (80-204-136-56)	501 ^{*1} (54-74-175-198)
Postgraduate degrees awarded (PhDs, MPhils, MScs, PGCERT/DIPG)	51* (11-5-34-1)	18 ^{*1} (4-7-6-1)
Staff (full time academics)	98 (53M 45F)	97
Staff (full time - all categories)	242	282
Research graduate programmes	31	31
Taught graduate programmes (MSc, Diplomas, PGCerts)	23 15, 5, 3	23 15, 5, 3
Faculty Publications (*with graduate students)	120 (*31)	101 (*33)
New external grants (number/value)	27/ J\$300,917,818	17/ J\$301,641,470
Outreach events	99	90
*As at October 31, 2022		
^{*1} As at October 2, 2021		

Teaching and Learning

At the beginning of the academic year, course delivery and examinations remained primarily online with a few exceptions for laboratory courses. By the start of semester two, most departments offered face-to-face labs which were carefully managed for strict adherence to national health protocols. Innovations which will likely continue beyond the COVID era are those centered on learning support services, which include video demonstrations, simulations, virtual supervision of off-site labs, and virtual Walk-in Labs for peer-to-peer technical assistance with coursework. All of the above facilitated student consultation as in a face-to-face environment.

Rebuilding for increased Access

The Department of Mathematics expanded seating capacity in its computing room from twenty (20) to thirty (30). They also acquired thirty (30) computers with the requisite software to enhance face-to-face and continued online teaching and learning in the upcoming academic year.

The Faculty launched "A Tech for Science: Laptop Drive" programme to provide laptops for students through a loan scheme managed by The Science and Engineering Library.

The Department of Computing and Huawei began collaborating on establishing a Huawei ICT Talent Hub in the Faculty. An initial donation of equipment was received to establish a training lab and to support a learning platform to deliver courses under a train the trainer initiative. The programme will be built out in subsequent years and will include partnership with Huawei's Seeds for the Future Programme, ICT Academy, ICT Competition, and Scholarship programme.

Rebuilding programme/course offerings for applicability and improved experience: The academic year saw the delivery of the following new and revised course/programme offerings.

The Department of Mathematics completed the curriculum revision of two (2) of its programmes - BSc Statistical Science and BSc Mathematics and Modelling Processes to meet the growing demands of a changing world. The Department also conducted online internal marketing with students at the preliminary level, level I and II, aimed at promoting the existing pro-

grammes, particularly the non-actuarial science programmes.

oNew courses in renewable Energy were approved for offer by the Department of Physics in the upcoming academic year. They are Fundamentals of Energy Statistics (PHYS2000) and Energy Information Management (PHYS3000).

Rebuilding the student experience: The Faculty made significant efforts to ensure that students could immerse themselves in university life outside of the classroom, notwithstanding the predominantly online environment. oSeveral activities were coordinated through the office of the Associate Dean for Student Experience which worked closely with the Faculty's Guild committee to provide online mentorship, mental health awareness seminars and a holistic development programmes. Signature events included 'The Total You Seminars', 'Walking in her Footstep' and 'Stimulus: Science in Action' programme.

A collaborative effort spearheaded by the Associate Deans for Undergraduate and Graduate Matters resulted in the second successful staging of Online Orientation activities.

The Faculty Office in partnership with the Mona Information Technology Services (MITS) produced the second virtual Faculty Awards ceremony in March 2022. Over four hundred (400) outstanding student and staff achievements were recognized.

Research

Research output, already hampered by inadequate infrastructure and financial constraints, was further hampered by the pandemic due to restrictions on movement and reduced bench-time, especially for graduate students. It is commendable then that the faculty's publication output increased from 1 to 1.2 per full-time academic, though this remains less than the targeted 1.5. This is a demonstration of staff's strong commitment to research and a solid foundation to build on.

Rebuilding through increased research partnerships and engagement

The Faculty welcomed several international researchers (staff and students) who participated in funded research with FST Staff.

In conjunction with researchers in the School of Education, the Climate Studies Group, Mona developed a suite of educational products focused

on climate change education for primary and high schools. The products included animations for teaching and a textbook entitled, 'Let's Make a Difference: A Caribbean Primer on Climate Change'. Under the initiative which launched the research, seven primary schools were provided with an eco-friendly gazebo and or portable tent with outdoor seating, powered by a fixed or portable solar energy-based solution. They also received gardens with endemic plants and trees, to encourage the students to care for and study their growth and develop a culture of protecting the environment. Two of the schools received automatic weather stations through the Meteorological Service of Jamaica.

A Microgrid Training Centre was installed and inaugurated at The Discovery Bay Marine Laboratory (DBML). The new 75kW system with battery back-up, SCADA system and supporting infrastructure, positions DBML as the Northern Caribbean's first Centre of Excellence for SMART grid training, research and education. With the addition the DBML is 100% powered by renewable energy resulting in per annum savings of USD \$14,300 and the mitigation of 90 to 100 metric tonnes of CO₂. The upgraded laboratory facility will also serve as a teaching and research centre for students enrolled in The UWI's Environmental Physics, Alternative Energy, and Power Engineering courses, as well as industry practitioners. Partners involved in the installation included the Technical Assistance Programme for Sustainable Energy in the Caribbean (TAPSEC), funded by the German Government and the European Union, and the Caribbean Centre for Renewable Energy and Energy Efficient (CEREEE).

The Faculty of received three research grants valued JMD 22.7 million from the Universal Service Fund (USF). The grants will facilitate research on three ICT-related projects being spearheaded by the Departments of Physics and Computing tackling national challenges linked to literacy, crime and violence, and smart city development in Jamaica.

The Department of Life Sciences received funding for eleven new research projects with the following partners: Forestry Department of Jamaica under the Ecosystem-based Adaptation (EbA) in Latin America to restore mangroves in Port Royal; The National Conservation Trust Fund of Jamaica (NCTFJ) for a Water Quality Assessment of Special Fisheries Conservation Areas; Sandals Resorts International for North Coast Mangroves Restoration and Conservation with special focus on Salt Marsh (Falmouth), Trelawny; The National Fisheries Authority (NFA), to train Jamaican fishers in

SCUBA diving; The Pesticides Control Authority (PCA), Ministry of Health to assess the pattern and use of agricultural pesticides and their residues in the Jamaican environment; The Planning Institute of Jamaica (PIOJ) to conduct a Rapid Ecological Assessment (REA) of the Wagwater, Rio Nuevo and Rio Bueno/White River Watershed Management Units; The National Environment and Planning Agency (NEPA) for the Palisadoes Islets Mangrove Restoration Project; Jamaica Conservation Partners (JCP) to investigate Queen Conch Induced Spawning by Density Manipulation; The National Fisheries Authority (NFA) to conduct a Queen conch population survey at Pedro Bank; The National Geographic Society to trace the plant diversity and origins of Jamaican root tonics, a symbol of biocultural heritage; and the Mohamed bin Zayed Species Conservation Fund to reassess the conservation status of *Cinnamodendron corticosum* (Canellaceae), a wild and popularly used spice tree in Jamaica.

Rebuilding research infrastructure

The Department of Chemistry received a donation of J\$3, 0005,847.81 (made possible through the discontinuation of the Mechanical Engineering Workshop) from the Dean's office that was used to purchase a Fourier Transform InfraRed (FT-IR) spectrometer valued at J\$4,978,738.00. The fund was in honour of the late Professor Tara Dascupta.

Rebuilding graduate student publishing

oThirty-one (31) of the one hundred and twenty (120) faculty publications (26%) were co-authored by graduate students. Graduate student publications accounted for up to a third of the publications produced by the Departments of Chemistry, Geography and Geology, and Physics.

Outreach

The faculty took advantage of the benefits the online space offered for greater engagement of local, regional and international stakeholders in outreach activities.

Rebuilding Science Discourse

The "Professor Speaks" and "Science for Today" series as well as weekly departmental seminars encouraged discourse on the relevance of science

to topical issues and on advancements in research. Issues examined included:

- The Science Behind Front of Package Food Labelling: Balancing Industry, Trade and Health Perspectives (Lead: Department of Chemistry)
- The Professor Speaks on Mangroves, Microplastics and Sargassum: What's the Connection? (Prof. Mona Webber, Department of Life Sciences)
- The Professor Speaks on The Power of Abstraction in Computer Science and Beyond (Prof. Daniel Coore, Department of Computing)
- The Professor Speaks on A Model of Data Science Research and Development (Prof. Patrick Hosein, Department of Computing, St. Augustine)
- inaugural Professorial Lecture: Atoms for Sustainable Development: The Application of Nuclear Sciences for National and Regional Growth (Prof. Charles Grant, ICENS)

Rebuilding International and Regional Outreach

SEB/ISE Conference:: The Natural Products Institute (NPI) hosted the 61st International Joint Conference of the Society for Economic Botany (SEB) and International Society of Ethnobiology (ISE) from May 29 - June 2, 2022. The theme, "Out of Many, One People: Biocultural Diversity across Borders" came to life as the conference welcomed two hundred participants (130 in person and 70 virtual delegates) from thirty countries. The conference explored the relationships between people and plants in the context of eight of the seventeen United Nations Sustainable Development Goals: No Poverty, Zero Hunger, Good Health & Well-being, Gender, Climate Action, Life Below Water.

One Ocean Expedition: Participants aboard the Norwegian, Statsraad Lehmkuhl research vessel which docked at Jamaica's Port Royal in November 2021 were hosted by The University of the West Indies (The UWI) Mona Campus for a tour of the Port Royal Marine Lab, a Mona campus tour and a Knowledge Exchange Forum on Tuesday, November 16, 2021. Two graduate students, Chauntelle Green, Department of Life Sciences, and Deron Maitland, Department of Physics, joined the ship's voyage through the Caribbean. Additionally, over one hundred UWI students and staff members toured the vessel while docked in Jamaican waters.

Rebuilding high school outreach

The Department of Mathematics continued with the coordination of the Jamaican Mathematical Olympiad programme. A Jamaican Olympiad team consisting of four high school students was selected to compete in the XXIII Central American and Caribbean Mathematical Olympiad (OMCC) held from August 9-14, 2021.

The Faculty's annual CAPE workshops in chemistry, biology, physics, math, and geography and computer science were staged online in January 2022. The workshops facilitated over one thousand five hundred high school students across Jamaica.

The Department of Computing partnered with Addiscoders Inc to host a free residential Summer Camp dubbed Jamcoders where fifty (50) secondary students across Jamaica were exposed to coding and algorithm for four weeks. The camp was organized in collaboration with Prof Jelani Nelson (of UC Berkley) founder of Addiscoder and members of the Caribbean diaspora. It was funded by Mr. Jamar McNaughton (aka Chronixx), Survival and Flourishing Fund and The D.E Shaw Group.

Rebuilding STEM teacher competencies

The BOOST programme aims to address the dearth of STEM teachers in the secondary school system by creating an annual stream of new teachers. In 2021, fifteen (15) STEM graduates from the faculty, representing cohort 1, were placed in 11 high schools across seven parishes to teach STEM subjects. All 15 completed the first year and received back-end scholarships equivalent to one year's University tuition and incentive payments based on an evaluation of their teaching performance. The programme is being executed in collaboration with The Faculty of Humanities and Education and The Mico University College through funding by the National Baking Company Foundation. At the end of the year, the National Commercial Bank Foundation (NCBF) joined as a new partner. NCBF's investment of JMD11 million will see ten additional graduates being engaged to deliver digital subjects in cohort 2. Cohort 2 will include graduates from other universities - The Mico University College and the University of Technology, Jamaica.

The faculty in collaboration with the Ministry of Education, Youth and Information and the School of Education facilitated CAPE Science Teacher workshops. The Teacher workshops were held from January 4-7, 2022, in

parallel with CAPE student workshops. The workshops consisted of pedagogical approaches to effective science teaching in addition to subject specific content.

Teachers from the Shortwood Teachers' College participated in an online biotechnology course offered by the Biotechnology Centre.

Communication and Staff Engagement

With limitations placed on social gatherings and face to face interactions, the Faculty and its Departments were creative with internal communication strategies to increase staff engagement, build effective work processes and promote enhanced productivity.

Rebuilding staff engagement

The Faculty Office has been refocused as a hub for and driver of staff engagement activities. In 2021/22 the Faculty Office coordinated monthly meetings for four Faculty committees: (i) Senior Administrative staff in each department (ii) Senior Administrative Officers across all Faculties, (iii) Lab managers and Technical staff, and (iv) Departmental Facilities Managers. Through these committees the faculty was able to organize online training activities and undertake Faculty-wide initiatives recognizing Technical and Service Staff Day (November), Administrative and Professionals Day (April) and Teachers' Day (May) and other social activities such as 'Academic Lymes'. The committees have also become an effective means to leverage expertise, share common experiences, undertake inclusive strategic planning, and enable information dissemination to all categories of staff members.

Rebuilding information flow and the faculty's external face

The Faculty continues to engage stakeholders through its social media (Instagram, Facebook, YouTube) and web pages. These media pages remain the principal means for disseminating faculty information including highlighting faculty research, activities, happenings, and achievements. There has been a steady growth in the number of followers over the last year.

The Departments of Mathematics, Chemistry, and Geography and Geology

launched redesigned web pages.

The FST has adopted a new online support system, 'Kayako' to improve customer service to its students. New services include a live online chat and a ticketed email system.

Finance

The operations of the faculty have been severely constrained by the financial challenges of the University. Nonetheless the Faculty managed to maintain the significantly increased grant funding from external sources from the previous academic year.

Rebuilding resource mobilization

Through the Resource Mobilization Unit (RMU) established in the Dean's Office, partnerships have been maintained and new partnerships forged with government ministries, private sector entities, external grant agencies, and alumni. The RMU negotiates internal UWI processes for establishing grant agreements, and supports with project oversight thereby allowing principal investigators greater flexibility to execute research tasks. The Unit oversaw the establishment of the Enith & Victor Bradley & ICENS Scholarship Fund and provides strategic oversight of the Faculty's Endowment Fund that has been steadily growing.

Notable events

Notable staff achievements for the 2021-2022 academic year include:

- Prof. Tannecia Stephenson was appointed Deputy Dean
- Dr. Sherene James-Williamson was appointed Head of the Department of Geography and Geology.
- Dr. Venkateswara Penugonda was appointed Head of the Department of Physics.
- Dr. Daniel Fokum was appointed Associate Dean, Undergraduate Matters
- Professor Ralph Robinson (Department of Life Sciences) was appointed Professor Emeritus.
- Dr. Marvadeen Singh-Wilmot and Dr. Mark Lawrence (Department of Computing) were promoted to the rank of Senior Lecturer.

- Dr. Henroy Scarlett was installed as President of the Environmental Federation of Environmental Health.
- Prof. Mona Webber (Department of Life Sciences) was awarded the Order of Distinction in the rank of Commander.
- Prof. Ronald Young (Former Dean) was awarded the Order of Distinction in the rank of Commander.
- Prof. Tannecia Stephenson received the Vice Chancellor's Award for Research Accomplishments.
- Dr. Venkateswara Penugonda received the Vice Chancellor's Award for Teaching.
- Dr. David Picking and Dr. Ina Vandebroek received the 2022 Society for Economic Botany President's Award.
- Prof. Rupika Delgoda was named the Anthony N Sabga Laureate for Science and Technology (2021)
- Dr. Peter Nelson (Department of Chemistry) and team cops Global Innovation Award for Lifesavers Wipes.
- The BOOST programme cops 2021 RJR Special Awards in the Category of Education.
- Dr. Winklet Gallimore, Dr. Ava Maxam, Dr. Phylisia Ricketts, Professor Marcia E. Roye, and Professor Tannecia Stephenson were honoured as 'Science & Technology XXtrordineers' by the Scientific Research Council (SRC).

The faculty was saddened by the passing of the following present or former members of staff:

Prof. Gerald Lalor

Ms. Beverly Cox (Department of Physics)

Mr. Rudolph Blair (Department of Physics)

Mr. Patrick Jarvis (Student)

Ms. Diandra Thompson, technical staff (Department of Chemistry)

Prof. Emeritus David Barker (Dept. of Geography and Geology)