



MONA

# FACULTY OF SCIENCE & TECHNOLOGY

*Year Ending July 31<sup>st</sup>, 2021*



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# DEAN'S 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.

## Redefining Possibilities

For the academic year 2020/21, the Faculty of Science and Technology continued to operate under the mantra "Becoming the Go-To place for Science Education, Training, Research and Solutions". Given the ongoing pandemic the faculty had to redefine the ways in which it approached its core activities to ensure continuity and growth while still pursuing its goals. The summary table below provides an overview of the faculty and its operations. The narrative that follows highlights some ways in which the faculty had to redefine its operations with respect to Teaching and Learning, Research, Outreach, Communication and Finance in response to the pandemic, as well as notable staff achievements.

**Table 1: Overview of the faculty**

	2020/21	2019/20
Undergraduate Students	2800	2786
Postgraduate students	350	363
Undergraduate programmes (majors/minors)	46/22	46/22
Undergraduate degrees awarded (1 <sup>st</sup> class, U2 <sup>nd</sup> , L2 <sup>nd</sup> , P)	501 <sup>+1</sup> (54-74-175-198)	430 <sup>+</sup> (33-151-142-104)
Postgraduate degrees awarded (PhDs, MPhils, MScs, PGCERT/DIPG)	18 <sup>+1</sup> (4-7-6-1)	58 <sup>+</sup> (9-6-41-2)
Staff (full time academics)	97	89
Staff (full time - all categories)	282	277
Research graduate programmes	31	31
Taught graduate programmes (MSc, Diplomas, PGCerts)	23 15, 5, 3	20 14, 4, 2
Faculty Publications (*with graduate students)	101 (*33)	105 (*26)

Active externally funded projects	22	13
New external grants (number/value)	17/ J\$301,641,470	11/
Operational Partnerships (student centered e.g. internships)	Goldman Sachs Huawei IBM CEMEX NCB	Goldman Sachs Huawei
Outreach events	90	73
<sup>*</sup> As at Sept 17, 2020		
<sup>*1</sup> As at October 2, 2021		

## Teaching and Learning

Most courses and exams within the faculty were offered using the online medium. This presented a significant challenge for the delivery of courses with laboratory components. In both semesters an attempt was made to offer Introductory Chemistry labs in a face-to-face mode with strict observance to established health protocols. This had to be curtailed in semester 2 when the national cases of COVID-19 surged. Some students were later accommodated in summer in very small numbers. Notwithstanding, staff rose to the challenge and found creative ways to deliver both theory and practical components of courses.

**Redefining Lab Delivery in an online environment:** The range of delivery options included video demonstrations, simulations, virtual supervision of off-site labs, and lab kits shipped to students. The Department of Computing pioneered Virtual Walk-in Labs for peer-to-peer technical assistance with coursework. This enabled students to consult their seniors for guidance as they would often do in a face-to-face environment.

**Redefining course offerings for applicability and improved experience:** The academic year saw the delivery of new and revised course offerings redefined for relevance and better student experience. These included a new course on mobile development (Department of Computing), revised Introductory Chemistry courses (Department of Chemistry) and revised advanced electronics and life sciences courses (Department of Physics and Department of Life Sciences respectively). The first cohort of students pursuing the B.Sc. in Software Engineering – Mobile Application Technologies graduated (Department of Computing). A new geography undergraduate programme with an internship option (Department of Geography and Geology) and new interdisciplinary and inter-Faculty courses were also approved for offer in 2021/22. The latter include a B.Sc. in Biomedical Radiation Science to be jointly offered by the Faculties of Science and Technology, Medical

Sciences and Engineering through the Department of Physics; and the Master of Science in Clinical Medical Physics with specializations in Radiotherapy or Diagnostic Radiology and Nuclear Medicine to be jointly offered by the Department of Physics and the Faculty of Medical Sciences.

**Redefining the student experience:** The faculty made significant efforts to allow students to still have a full university experience notwithstanding the online environment. Many activities were coordinated through the Associate Dean for Student Experience who worked closely with the Guild to provide online mentorship, mental health and holistic development programmes and activities, as well as oversight for the faculty tablet loan scheme. A collaborative effort spearheaded by the Associate Deans for Undergraduate and Graduate Matters saw the successful staging of online orientation activities. The Faculty Office working with Mona Information Technology Services (MITS) also produced a virtual Faculty Awards ceremony in March 2021 at which outstanding student and staff achievements were recognized.

## Research

Restricted movement, obsolete equipment, less than adequate lab infrastructure, and the inability to travel for international collaborations made for a challenging research environment. Though the faculty's publication output of approximately 1 per full-time academic was sustained, it is less than the targeted 1.5. It nonetheless reflects the resilience and determination on the part of staff to continue their research and to publish notwithstanding.

**Redefining research partnerships:** A partnership agreement with Canadian company Field Trip Ventures Inc. resulted in the opening of a new research facility in the faculty dedicated to psychedelic fungi. The Field Trip Natural Products (Ja) Limited Research and Development Laboratory officially launched in February 2021 and is the world's first legal research and cultivation facility dedicated exclusively to psilocybin-producing mushrooms and other plant-based psychedelics. The private-sector academia partnership is overseen by the Natural Products Institute (NPI) and has the additional promised benefits of graduate student employment and scholarships.

**Redefining research possibilities:** The UWI and the Meteorological Service Jamaica (MSJ) signed a Memorandum of Agreement (MoA) in September 2020 which facilitated the installation of an automatic weather station (AWS) on the Mona Campus. The MoA will facilitate collaborative research and software development for improved climate data collection and information management. This will be led by the Department of Physics. Other examples of public sector partnership-driven research activities initiated during the year include with: (i) the National Environment and Planning Agency (NEPA) to pursue ecological assessment for the integrated management of the Yallahs and Hope River Wa-

tersheds; and to undertake mangrove restoration on the Palisadoes islets; and (ii) the National Fisheries Authority (NFA) to conduct a survey of Queen conch at Pedro Bank (Department of Life Sciences).

**Redefining graduate student publishing:** 33 of the 101 publications (32%) produced by the faculty were co-authored by graduate students. Notably, graduate student publications accounted for approximately half of the publications produced by the Departments of Chemistry, Life Sciences, and Physics.

## Outreach

The online medium expanded the reach of the faculty's outreach programmes and facilitated greater engagement of regional and international colleagues in faculty outreach events.

**Redefining Science Discourse:** The "Science for Today" series encourages discourse on the science aspects of topical issues. In 2020/21, under the banner of the series, Departments and their collaborators hosted online discussion fora on: (i) Cybersecurity (Department of Computing); (ii) Jamaica's Advancement Towards Electric Vehicle Technologies (Department of Physics); (iii) Fighting Covid-19: a three part Science in Action Forum (multiple Departments, the Natural Products Institute and the Biotechnology Centre); (iv) Landslides (Department of Geography and Geology); (v) Ash in the Air: La Soufriere, St. Vincent (Dept. of Geography and Geology); and (vi) Leveraging Technology in the Fight against Gender-based Violence in Jamaica (Faculty Office). Notably, the forum on cybersecurity resulted in an invitation for submission and presentation by the Department of Computing to the Joint Select Committee of Parliament on revisions to the Cybercrimes Act, 2015. Some Science for Today fora are available on the Faculty's YouTube channel.

**Redefining high school outreach:** The first two rounds of the Jamaican Mathematical Olympiad Competition annually hosted by the Department of Mathematics were for the first time staged using an online platform specially developed by the Mona Information Technology Services (MITS). This meant that only the final rounds of the primary and senior level competitions were held face-to-face. Similarly, the Faculty's annual CAPE workshops in chemistry, biology, physics, math, geography and computer science were staged entirely online and facilitated over five thousand high school students across the length and breadth of Jamaica.

**Redefining STEM teaching:** The Faculty launched the Building Out Our STEM Teachers (BOOST) Programme. The programme was conceptualized by the faculty and will see graduates placed in high schools to teach STEM subjects for up to three years. In return they will receive mentorship, networking opportunities, tuition refund and an incentive payment for each year spent in teaching. The programme is being executed in collab-

oration with The Faculty of Humanities and Education and The Mico University College. The National Baking Company Foundation (NBCF) has invested J\$159.6 million over the six-year lifespan of the programme. Other collaborators are the Jamaica Teaching Council, The Students' Loan Bureau, Digicel Foundation, the Ministry of Education Youth and Information, the National Education Inspectorate and the American Friends of Jamaica.

**Redefining STEM teaching competencies:** The Department of Physics partnered with the Caribbean Examinations Council, the School of Education, and the Faculty of Engineering to host a three-day workshop in August 2020 aimed at strengthening teacher training in the CAPE® Green Engineering Syllabus. This project is an intervention of the Technical Assistance Programme for Sustainable Energy in the Caribbean (TAPSEC), co-funded by the European Union and the German Cooperation, and supported by the Caribbean Community (CARICOM) Secretariat. Similarly, teachers from the Shortwood Teachers' College participated in an online biotechnology course offered by the Biotechnology Centre.

## Communication

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

**Redefining staff engagement:** The Faculty Office has been refocused to become a hub for and driver of staff engagement activities. In 2020/21 the Faculty Office coordinated monthly meetings for four new 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). 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.

**Redefining work processes:** With the assistance of the Department of Computing, the faculty's ICT Steering Committee initiated the development of a Document Management Workflow on Peoplesoft. The workflow is designed to solve the problem of managing the routing of select university business documents through the various business units of the university in fulfilment of select business processes, e.g., changes of grade and access to systems. The workflow was conceptualized, designed, and configured by the Department of Computing in collaboration with the Office of the Campus Registrar and Mona Information Technology Services (MITS), and is being piloted in the faculty.

**Redefining information flow and the faculty's external face:** The Faculty successfully launched an Instagram page and a YouTube channel to complement its Facebook and

web pages. These media pages have become 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. In support of this, the faculty has also created templates for monthly departmental reporting to Faculty Board, from which information is extracted for the social media pages and used to track the progress of the faculty in key areas over the course of the year. The Department of Geography and Geology launched redesigned web and social media pages.

## Finance

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

**Redefining resource mobilization:** In 2017 the post of Resource Mobilization Officer was established in the Faculty Office. Through this desk, new resources have been brought into the faculty through partnerships with government ministries, private sector entities, external grant agencies, and alumni. These include the establishment of new student internship opportunities with Cemex and IBM and the expansion of relationships with Huawei and Goldman Sachs. It also includes new scholarships e.g. The Pauline Lawrence and Carlton Davis undergraduate and postgraduate scholarships. The desk also coordinates training for staff in grant writing, negotiates internal UWI processes for establishing grant agreements, and supports with project oversight thereby allowing principal investigators greater flexibility to execute research tasks. There has also been an increase in the number of scholarships and bursaries on offer in the faculty through the efforts of Departments. New scholarships include: The Massy United Scholarship, The Long Actuarial Scholarship, The Norbert Fullerton Scholarships (Department of Mathematics); The Physics Honours Society Award and the Charlton Foundation Award (Department of Physics), The Ezra Mugisa Award (Department of Computing).

## Notable events

Notable staff achievements for the 2020/21 academic year include:

Dr. Donna Minott Kates was appointed as Head of the Department of Chemistry.

Professors Charles Grant (ICENS) and Tannecia Stephenson (Department of Physics) were promoted to the rank of professor.

Professors Ishenkumba Kahwa and Helen Jacobs (Department of Chemistry) were appointed Professors Emeriti.

Dr. Curtis Busby-Earle and Dr. Daniel Fokum (Department of Computing) were promoted

to the rank of Senior Lecturer.

Prof. Charles Grant received the Vice Chancellor's Awards for Public Service.

Prof. Mona Webber (Department of Life Sciences) received the Gold Musgrave medal from the Institute of Jamaica for research.

Prof. Rupika Delgoda (Natural Products Institute) was named the Sabga Laureate in Science 2021

Dr. Orinthia Howe, (Senior Administrative Officer, Department of Mathematics) earned her Doctorate in Business Administration

Ms. Miriam Lindo, Senior Administrative Officer in the Faculty Office retired.

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

Professor Henry Ellis and Professor Emeritus Kenneth Magnus (Department of Chemistry)

Mr. Krishna Deonarine and Ms. Diandra Thompson, technical staff (Department of Chemistry)

Mr. Trevor Ramikie, PhD candidate (Department of Chemistry)

Dr. Martin Aub, retired former Dean (Department of Mathematics and Faculty Office)

Ms Yvonne Francis, service staff (Department of Mathematics)

Dr. Jeremy Woodley, retired former Director, Center for Marine Sciences (Department of Life Sciences)

