

FACULTY OF SCIENCE AND TECHNOLOGY Mona

Year ending July 31, 2023



PROFESSOR MICHAEL A. TAYLOR
BSC, MPHIL, UWI, PHD, UNIVERSITY OF MARYLAND, COLLEGE PARK
DEAN

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.

The Faculty of Science and Technology (FST) began the 2022–2023 academic year with an enhanced approach to teaching, learning, research, administration, and general operations, capitalizing on the lessons learnt during the peak of the COVID-19 pandemic. The Faculty resumed in-person operations while maintaining some activities and course/program deliveries online as approved by the university's administration. A change in the Faculty's management team occurred as Dr. Sherene James-Williamson succeeded Prof. Donovan Campbell as the Head of the Department of Geography and Geology, and Dr. Daniel Fokum assumed the role of Associate Dean for Undergraduate Matters.

The Faculty's strategic goals and operations continued to align with the established vision of "Becoming the Go-To place for Science Education, Training, Research, and Solutions," resulting in several achievements aimed at ensuring the sustained growth of the Faculty, despite the prevailing challenges. The Faculty also strategically coordinated its operations to host a variety of events in honor of The UWI's 75th-anniversary celebrations, commencing in January 2023.

The summary table below offers an overview of the Faculty and its operations. The narrative that follows highlights the ways in which the Faculty worked to maintain, pivot and expand its efforts at Teaching and Learning, Research, Outreach, Communication, and Resource Mobilization in the post-COVID year.

Table 1: Overview of the FST, 2022–2023

AREAS	ACADEMIC YEAR	
	2022–2023	2021–2022
Undergraduate Students	2310	2475
Postgraduate students	326	319
Undergraduate programmes (majors/minors)	46/22	46/22

Undergraduate degrees awarded * (1st class, U2nd, L2nd, P)	387 (147M/240F) 55-146-140-46	476 (177M/299F) 80-204-136-56
Postgraduate degrees awarded (PhDs, MPhils, MScs, PGCERT/DIPG)	52 (2-5-45-0)	51 (11-5-34-1)
Staff (full time academics)	104	98
Staff (full time - all categories)	249	242
Research graduate programmes	31	31
Taught graduate programmes (MSc, Diplomas, PGCerts)	23 15, 5, 3	23 15, 5, 3
Faculty Publications (*with graduate students)	98 (*23)	120 (*31)
New external grants (number/value)	17/ J\$377,573,743	27/ J\$300,917,818
Outreach events	100	99

*As at October 31, 2023

TEACHING AND LEARNING

All departments returned to delivering courses and examinations primarily via the face-to-face modality, with a few still providing some online options with approval. The approach facilitated the gaining of practical skills necessary for the STEM fields, especially since it was observed that some advanced-level students faced challenges in executing the practical components of their courses. This was attributed to skills deficits resulting from pre-requisite labs only being offered online during the COVID years. Departments developed strategies to address these recognized shortcomings.

The academic year saw the introduction of new and revised course/program offerings designed for relevance and an enhanced student experience. The Department of Physics introduced two new free-elective courses, “Fundamentals of Energy Statistics” (PHYS2000) and “Energy Information Management” (PHYS3000). The Department of Chemistry gained approval for two new courses in Water Treatment (CHEM2420 and CHEM2421), along with a Radiochemistry course (CHEM2810), developed in support of the interdisciplinary BSc in Biomedical Radiation Sciences program. The Department of Computing revised nine courses for the BSc in Information Technology program and introduced a new course, Security Analysis and Digital Forensics (INFO3165). Additionally, three students received ‘free’ training from the International Software Architecture Quality Board (iSAQB) under the iSAQB/UWI agreement.

In the spirit of ‘One-UWI’, the Department of Geography and Geology embarked on cross-campus teaching collaborations with colleagues from the Department of Geography in St. Augustine. Students from St. Augustine were able to enrol in Mona’s Applied GIS and Remote Sensing Course as part of their Geographic Information Systems (GIS) minor, which was introduced during the 2022–2023 academic year.

Undergraduate students continued to be afforded internship opportunities with companies, including National Commercial Bank (NCB-UWI Agile Lab, etc.), Sagicor Jamaica Limited, PricewaterhouseCoopers Jamaica, Best Dressed Chicken, Port Authority of Jamaica, STATIN, Digicel, Grace Kennedy Limited, E-Gov Jamaica, Grid Dynamics, Petrojam Limited, Jamalco, J. Wray & Nephew Limited, Industrial Chemical Company (Jamaica) Ltd, Environmental Solutions Limited, Grace Food Processors (Canning) Limited, Bureau of Standards, Jamaica, Rainforest Limited, Berger Paints Jamaica Limited, Edgechem Limited, SEPROD Group of Companies, Grace Food Processors (Meats) Division 13, WISYNCO (True Juice) Division, Caribbean Broilers, Scientific Research Council, Sherwin-Williams Jamaica Limited, PA Benjamin Jamaica Limited, Huawei Technologies Jamaica and CEMEX.

The Office of the Associate Dean for Graduate Studies and Research obtained official approval for the offering of a faculty-wide research methods course titled “Research Method for the Sciences” (GRSM6550). The course will commence in September 2024 and will be a requirement for all new graduate students. The Dean’s Office took the initiative to develop a “Graduate Coordinator Reference Guide.” This guide will serve as a valuable reference tool for Graduate Coordinators in the execution of their responsibilities. Forty-six students received departmental awards and eighteen students received UWI Postgraduate scholarships for the 2022–2023 academic year.

Increasing Access

Throughout the 2022–2023 academic year, alumni, retired colleagues, and friends of the Faculty demonstrated their commitment to expanding access to tertiary education through the establishment of scholarships/awards and the enhancement of laboratory facilities. Their collective contributions amounted to approximately JMD\$10.4 million.

The Embassy of the People’s Republic of China in Jamaica donated JMD\$5.4 million to the Faculty to support the establishment of the Huawei ICT Lab – a part of the larger Huawei ICT Talent Hub partnership with The UWI in Jamaica. Mrs. Joy Spence (distinguished Chemistry alumna,) through J. Wray and Nephew, generously donated JMD\$1.5 million for provision of analytical balances for undergraduate laboratories, and refurbishment of the Kenneth E Magnus (Unit Operations) Laboratory. Similarly, JMD\$3 million bequeathed by the late Professor Ellis was used

to establish the “Henry A. Ellis Scholarship for Physical Chemistry.” In addition, the family of the late Professor Wilfred Chan contributed USD\$2800 to provide support for the existing Wilfred R. Chan Undergraduate Prize in Chemistry over a five-year period, from 2023 to 2028. Dr. Patrick Gordon, a Fulbright Scholar now at the Massachusetts College of Pharmacy and Health Sciences donated textbooks and molecular models to the Chemistry Department. The Department’s Occupational, Environmental Safety & Health (OESH) program received a generous donation of ten pre-owned noise dosimeters, one sound level meter, and two calibrators from visiting Adjunct Professor Dr. Gary Brown, representing Eastern Kentucky University, USA.

The Faculty hosted its Annual Awards Ceremony on April 6, 2023 (for 2021–2022 AY), during which approximately 400 students (and staff members) were recognized for their exceptional academic achievements and their active participation in ‘co-curricular activities and leadership roles’. The inclusion of the leadership category was a new addition, aimed at acknowledging the broader attributes necessary for cultivating the ideal UWI graduate. To note, approximately 40 departmental awards and prizes, including some with monetary incentives, were presented to deserving students. A number of students were also inducted in the departments’ Honours Society during the year to further recognise their academic excellence. The Honours Societies also serve as platforms for networking, leadership development and societal engagement. Ms. Danielle Mulling (BSc. Software Engineering) from the Department of Computing was selected as one of the Valedictorians for 2022–2023 graduation ceremony.

Enhancing the Student Experience

With a strong focus on reintegration and the cultivation of a more student-centric face-to-face educational environment, the faculty’s Student Experience Team orchestrated a series of events to cater to the needs of the students. The primary goal was to foster a balanced and holistic experience for FST students. The inaugural event was a faculty-wide “Meet and Greet” session, held at the departmental level. At the well-attended events, students had the opportunity to socialize with their peers and staff in a relaxed setting.

Throughout the year, the faculty hosted monthly ‘Total You’ Seminars, which included topics such as “Joy to the World: The Power of an FST Degree,” “You only Fail when you Quit: How to turn Academic Disappointments into Success,” “Tools for Understanding and Managing Anxious Thoughts and Feelings,” “My FSTeXperience: How to get the grades, achieve your dream, and enjoy it all,” “Achieving Academic Success: A guide to effective Exam Preparation,” and “Mindful Movements: Yoga Therapy for University Students to relieve Stress and Anxiety,” among others. Several of these sessions facilitated alumni engagement as invited speakers.

A noteworthy highlight from one of the sessions was a tour of the Appleton Estate in St. Elizabeth by twelve students, courtesy of Joy.

The Tech for Science Program was also expanded, with fellows from the Building Out Our STEM Teacher (BOOST) program contributing an additional laptop. Additionally, through a collaborative effort involving WIGTON Windfarm Ltd, The UWI Development and Endowment Fund (UWIDEF), and The UWI Mona Guild, two undergraduate students were gifted laptops.

In an effort to enhance academic readiness for Semester 2, 2022–2023 academic year, the annual Study Skills Workshop was hosted. The format was restructured to provide a more immersive experience for the students. The result was two full days of workshop activities on January 20–21, 2023, with students choosing to attend one day. A total of 288 students from all levels actively participated in activities designed to help them identify their unique learning styles, create learning profiles, develop effective time management strategies, and construct personalized study schedules. They also gained an understanding of the science of learning and the study cycle. The Faculty participated in the OSSD-led Career Month observed in February 2023. A panel included Chemistry alum Czerne Reid, from the University of Florida.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) partnered with the Walking in Her Footsteps program, conceptualized by the faculty, which is now dubbed UWI-UNESCO Walking in Her Footsteps. In celebration of International Women's Day on March 9, 2023, a networking reception was held for the mentors and mentees. Twenty-seven girls from The University of the West Indies, Mona (The UWI Mona) and the University of Technology, Jamaica (UTech, Ja), studying mathematics, physics, life sciences, chemistry, geography and geology, biotechnology, computer sciences, and applied sciences were paired with female STEM professionals from the private and public sectors. The activities executed included the STEM Tour (supported by Juici Patties) to Huawei, CEMEX, NPI, and ICENS, a Shadowing Event, and Community-based projects. A group of female students participated in the National Commission on Science and Technology STEM Mentee Workshop on Wednesday, November 23, 2022, under the Walking in Her Footsteps program.

Two final-year Geography majors in the Faculty of Science and Technology attended the YouthMappers Leadership Fellowship Summit held in Montego Bay, Jamaica, from January 3 to 13, 2023. This summit offered an invaluable opportunity for these students to delve into the realm of GIS Science and its pivotal role in constructing resilient communities. As a result of their enriching experience, the YouthMapper Mona Chapter was officially launched on March 30, 2023.

RESEARCH

Research is a fundamental pillar of the Faculty's activities. Nevertheless, the productivity of the Faculty's research endeavours is being adversely affected by various challenges, including outdated equipment, inadequate laboratory infrastructure, reduced bench time for graduate students, and an overall unfavourable financial environment. Despite these challenges over fifty staff members were recipients of the Principal's Research Awards held in June 2023. To boost the research morale of the departments, The Office of the Dean has introduced a research award to recognize the department with the highest number of publications per capita for a given academic year. The Department of Geography and Geology received this award, having produced over 30 publications during the reviewed period (2021–2022).

The Department of Chemistry, in particular, suffered a significant setback with the malfunction of the 500 MHz NMR (Nuclear Magnetic Resonance) spectrometer, leaving the department without NMR capabilities, which are crucial for both undergraduate and graduate programs. Efforts are currently underway to secure funding for the replacement of this essential equipment.

The University of the West Indies Mona Analytical Chemistry (UWIMAC) Laboratory, a commercial facility within the Department, successfully retained its ISO accreditation granted by the Jamaica National Agency for Accreditation (JANAAC).

The Department of Geography and Geology took significant steps to enhance its research capabilities. The Department re-established the Unit for Disaster Studies and the Marine Geology Unit, which will be coordinated by Dr. Arpita Mandal, Dr. Rose-Ann Smith, Dr. Taneisha Edwards, and Dr. Jason Tambie. A handover meeting for the Marine Geology Unit was held to symbolically pass the baton from Professor Emeritus Edward "Ted" Robinson, who initiated the unit over 20 years ago, to Dr. Taneisha Edwards and Dr. Jason Tambie. Another significant accomplishment for the Department was getting the Late Cretaceous Rudist Bivalves of the Caribbean Province, Jamaica listed 38th among The First100 International Union of Geological Sciences (IUGS) Heritage Sites. The IUGS listing comprises geological sites from around the world that are iconic and recognized by the global geoscience community as a reference for their impact in understanding the Earth and its history. The Jamaican site is located in the Rio Minho watershed of Clarendon and is the most diverse and thickest limestone succession with abundant rudist bivalves within the Caribbean Faunal Province.

The Earthquake Unit recorded a total of 407 seismic events between August 2022 and July 2023. This included 164 local earthquakes, 91 near-region events, 80 regional events, 48 distant events, and 24 blasts.

Additionally, the year witnessed ongoing planning efforts toward the establishment of the Caribbean Centre for Research in Bioscience (CCRiB). This Centre will result from the merger of the Natural Products Institute (NPI), the Mona Institute of Applied Sciences (MIAS), the Biotechnology Centre, and the Pesticide Research Lab and is set to be formally institutionalized in October 2023.

Research partnership and engagement

The Faculty welcomed a number of international researchers (staff and students) who participated in funded research. Researchers/partners were from Rutgers University, University of California, University of Texas, Kyoyo University, Williams Lynam Eco Ltd., Harvard University inter alia.

Graduate student publishing

Twenty-three of the ninety-eight (23%) publications produced by the faculty were co-authored by graduate students.

OUTREACH

The Faculty continued its outreach initiatives to engage our stakeholders – showing the value of science and technology for society – while showcasing research and teaching capacities existing within the faculty.

- **Showcasing Science:** The Faculty of Science and Technology (FST) hosted a Science Festival between March 31 and April 1, 2023 as part of the 75th Anniversary celebrations of The University of the West Indies. The festival showcased science and technology in business, government, security, health and wellness, environment and education; as well as products and services developed through Science and Technology. It also provided a space for the public to engage with Science and Technology in interactive, informative, and innovative ways. Over three thousand persons passed through the two-day festival.
- Other key UWI 75th activities outreach activities hosted were: A Royal Society Conference (Co-host), Eco-Science Experience, and a Night with the Stars among others.
- **Science Discourse:** The “Professor Speaks”, “Science for Today” series and departmental seminars continued to encourage discourse on the science aspects of topical issues while showcasing current research and researchers. In 2022/2023, the Departments and their collaborators hosted the following events:
 - A Symposium on Global Security Perceptive
 - Synchrotron Light: Energizing Modern Advanced Economies in Caribbean Islands Symposium

- Let the Research Speak for Itself Part 1 – an international collaboration with a consortium of universities
 - Inaugural Lecture for Professor Tannecia Stephenson
 - A Special UWI 75th Lecture with Prof. Paul Reese: Harvesting a Selection of the Fruits of Nature
 - A Seminar in honour of Professor emeritus Kenneth Eugene Magnus: The Legacy of Prof. Kenneth Magnus: Transforming Lives, Institutions and the Economy.
 - ChatGPT and Education: Threat or Opportunity – a public lecture?
 - The weekly Biotechnology, Chemistry, Life sciences and Mathematics Seminar Series
 - Disaster Heritage: Can Memorialising Disaster Make People More Resilient? – A Discussion forum.
- **STEM Building in High Schools:** The Department of Mathematics continued its successful annual Jamaican Mathematical Olympiad program. The 2022-2023 edition saw the participation of 2,800 students from 92 schools and a return to a face-to-face experience. Similarly, the Faculty returned to face-to-face modality for its annual CAPE workshops in chemistry, biology, physics, mathematics, geography, and computer science. These workshops remain a valuable resource with over 1,500 high school students from more than 30 schools across Jamaica participating in the January 2023 edition. In collaboration with Addiscoders Inc, the CHOR Foundation, and members of the diaspora, the Department of Computing hosted the second edition of the JamCoders free residential Summer Camp. This unique program exposed 50 secondary students from Jamaica to a comprehensive four-week journey into coding and algorithms during the summer of 2023. The program's success was greatly enhanced by collaboration with 12 partner organizations. Additionally, the Faculty coordinated a Summer Internship program in conjunction with the Bethel Baptist Church, placing eight secondary students in various departments and the Health Center to provide them with valuable on-the-job experience. The Faculty also continues to play a significant role in engaging numerous secondary institutions, while serving as a central 'resource centre' for laboratory activities and educational tours.
 - **STEM Teaching:** The Building Out Our STEM Teachers (BOOST) program, established in 2021, was designed to address the persistent gap caused by the annual migration of STEM educators in Jamaica by cultivating a steady supply of high-calibre STEM teachers. Since its inception, BOOST has successfully recruited 34 Teacher Fellows, with 28 currently active, across 23 different schools spanning eight parishes. Notably, the program has achieved an impressive

retention rate of 80% for Cohort 1, with 12 out of 15 teachers choosing to remain in the classroom for a second year. BOOST's impact is significant, directly influencing 5,307 students to date. This initiative is sustained through ongoing support of nine strategic partnerships drawn from the public, private, and not-for-profit sectors.



- **STEM Teaching Competencies:** In an era of rapid technological advancement, educators must also be at the forefront of digital transformation by utilizing available ICT tools to enhance (not replace) their pedagogical practices. To this end, The UWI, Mona, in collaboration with E-Learning Jamaica Company Limited, successfully conducted an Artificial Intelligence (AI) workshop for secondary school teachers entitled, “Artificial Intelligence: An Orientation and Exploration of its Classroom Applications,” on August 22–23, 2023. The workshop, hosted by the Faculties of Science and Technology and Humanities and Education, welcomed an enthusiastic cohort of approximately forty (40) teachers eager to explore the potential of integrating Large Language Models (LLMs) in their classrooms.
- **School Engagement:** In collaboration with Marketing, over 20 secondary intuitions were visited across Jamaica.
- **Community Engagement:** A program to reach yam farmers was initiated by the Biotechnology Centre (Dr Sylvia Mitchell) in January 2023 in collaboration with a team of farmers in Harker’s Hall, St Catherine and endorsement by the St Catherine 4-H Clubs. The program is named the Yam Youth Farmers Training Program and brings together academics, young and old yam farmers, and agricultural educators. This collaboration has produced several firsts including *D. trifida* true seeds being germinated in vitro. Several field farmer training days and presentations on this program occurred.

COMMUNICATION

The Faculty continues to find creative ways to enhance communication with students, staff and other stakeholders. The Faculty maintains various online platforms, including Instagram (with 1,788 followers), Facebook (with 783 followers), a YouTube Channel (with 950 subscribers), and the official website. These digital

channels serve as the primary means for disseminating essential faculty information, which includes the promotion of faculty research, activities, events, and achievements, among other pertinent updates. Over the past year, there has been a consistent increase in the number of followers and subscribers on these platforms, demonstrating a growing audience for the Faculty's content. The Faculty remains committed to enhancing its online presence through the redesign of departmental webpages with the support of the MITS team. Additionally, enhancements have been made to the Graduate program webpages to ensure an improved user experience.

STAFF ENGAGEMENT

Throughout 2022–2023, the Faculty Office remained the central hub and catalyst for staff engagement initiatives. The Faculty Office orchestrated a range of activities geared towards enhancing staff welfare and professional development, including the hosting of seminars dubbed “Morning Bold. Ready. Engaged .Well-rounded” and orientation sessions designed for new staff members.

The Faculty continued its tradition of recognizing and celebrating various categories of staff through special events such as Teachers' Day, Administrative Professionals' Day, and Technical and Service Staff Day. ATS staff members were specially commended through the Unsung Heroes Award which honored their unwavering dedication and commitment to the Faculty's mission. The Faculty also partnered with HEART/NSTA to provide training and certification in the areas of Public Area Hygiene Attendant and Turf/Landscape Management to service staff. To date 31 staff members have been trained under this initiative.

Various committees established within the Faculty and coordinated by the Faculty Office (e.g. the Beautification Committee, the Lab Managers Committee, FST Administrators Committee, etc.) have proven to be effective platforms for harnessing collective expertise, sharing common experiences, engaging in comprehensive strategic planning, and facilitating the dissemination of information to all categories of staff members.

RESOURCE MOBILIZATION

The operations of the Faculty have faced significant constraints due to the University's financial challenges. Nevertheless, the Faculty through its Resource Mobilization Unit (RMU) has managed to successfully pursue new grant funding from external sources during the past academic year. The RMU has been pivotal to successfully maintaining existing partnerships and forging new collaborations with government ministries, private sector entities, external grant agencies, and alumni. The Unit also made substantial progress toward the launch of the FST Alumni Association

scheduled for academic year 2023–2024. A notable precursor to this launch was the successful hosting of a 75th Anniversary Alumni Brunch and Lyme event on July 16, 2023. The RMU continues to serve as the primary facilitator for negotiations pertaining to internal UWI processes concerning grant agreements and provides invaluable support for project oversight, affording principal investigators greater flexibility in the execution of their research tasks. Furthermore, the Unit exercises a strategic oversight role in managing the consistent growth of the Faculty's Endowment Fund.

Notable Events

Notable staff achievements for the 2022–2023 academic year include:

- Dr. Donovan Campbell was promoted to Professor of Environmental Geography
- Dr. Louis-Ray Harris was promoted to Senior Lecturer
- Prof Paul Reese retired after serving the University for over 30 years and was appointed Professor Emeritus
- Prof. Ralph Robinson was appointed Professor Emeritus
- Dr. Winklet Gallimore, Professor Marcia Roye, Dr. Phylicia Ricketts and Professor Tannecia Stephenson were recipients of the XXtroordineers Award from the Scientific Research Council.
- Dr. Eric Garraway, Lecturer and Entomologist (Department of Life Sciences) who was awarded the Silver Musgrave Medal for Science

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

- Dr. Phylicia Ricketts (Department of Physics)
- Dr. Victor Emmanuel Douse (Department of Physics)
- Dr. Trevor Yee (Natural Products Institute)
- Mr. St. Elmo Whyte (Department of Mathematics)