

# **FACULTY OF ENGINEERING Mona**

**Year ending July 31, 2023**



**DR. ADRIAN LAWRENCE  
PH.D., M.SC., B.SC., P.E.  
DEAN**

## Dean's Overview

The 2022–2023 Academic Year for the Faculty of Engineering (FOE) marked the return, for the first time since the onset of Covid-19, of full face-to face delivery of lectures, laboratory exercises and practical components of courses and saw the Faculty of Engineering (FOE) continue to effect changes to the curricula of all four of its Bachelor of Science degree programmes as a part of the ongoing endeavour to continuously assess and improve course content, remain in step with industry standards, bring them in alignment with recommendations from international accreditors ABET, while maintaining the teaching and learning objectives of the Faculty.

The FOE's intent to create a world class teaching and research facility; forging strong synergies with our industrial and commercial partners is still in focus. The Faculty's outreach and growing impact in Jamaica and the wider Caribbean region resulted in an increase in the total number of applications to the Faculty in Academic Year 2022/2023 with a total of 420 applicants versus 353 in Year 2021/2022, resulting in a 1.71% increase in the total number of new students registered when compared to the Academic Year 2021/2022. There was, however, an 11.3% reduction in the number of returning students which resulted in the total registration in the Faculty moving from three hundred and twelve (312) students in 2021/2022 to two hundred and ninety two (292) students in 2022/2023 (-6.41%).

As in previous years, the Civil Engineering degree programme registered the highest number of new students of all the degree programmes. Table 1 shows a breakdown of total student registration by programme as well as a breakdown of the total registrations in terms of new students versus returning students.

**Table 1:** Breakdown of Student Registration

Preliminary Engineering	47
Biomedical Engineering	52
Civil Engineering	107
Electrical Power Engineering	37
Electronics Engineering	49
<b>New students</b>	<b>119</b>
<b>Returning Students</b>	<b>173</b>
<b>Total in Programme</b>	<b>292</b>

The Faculty Team – administrative, technical and support staff – continued to work in tandem with lecturers to ensure that the student experience remained at a high and superior standard to that of most other institutions, and remain at the forefront in propelling growth, development and innovation in the Caribbean and the world. The following accomplishments mirrored the guiding pillars of the University.

# ACCESS

## STUDENT ACHIEVEMENT

### Prizes Awarded to Students

The Ministry of Education, Youth and Information continues to make the scholarships available to Engineering students. This year, Ms. Sasha Gay-Wright, Dr. Roxann Stennett-Brown, Dr. DaVaugh Sanderson and Dr. Omar Thomas served on the panel of interviewers for the MathScience TVET Education & Engineering (MSTVETT) Scholarship. Thirty-six (36) engineering students were awarded full tuition scholarships which represents a 100% increase over the eighteen (18) scholarships awarded to engineering students in Academic Year 2022/2023. Table 2 shows the distribution of the 2023/2024 awardees by programme most recent list of the number of awardees by programme is shown below:

**Table 2:** MSTVETT Scholarships Awarded to the Faculty of Engineering

Programme of choice	Number of new students receiving scholarships
Biomedical Engineering	5
Civil Engineering	12
Electrical Power Engineering	9
Electronics Engineering	2
Preliminary Engineering	8
<b>TOTAL</b>	<b>36</b>

### Outreach-Open Day

The Faculty of Engineering hosted its Open day on Thursday, March 30, 2023. Over 36 schools from across Jamaica were invited to participate and the event was advertised on both The UWI Mona and the Faculty of Engineering Social Media pages.

The day started with a morning information session with over 100 students from Calabar, Wolmer's High School for Boys, Wolmer's High School for Girls, Meadowbrook High, Queens High, and Waterford High in attendance. Presentations were made by the Dean, Dr. Adrian Lawrence, Deputy Deans Dr. Omar Thomas, Dr. Roxann Stennett-Brown, Dr. Lindon Falconer, and Head of Biomedical Engineering Ms. Sasha-Gay Wright. Prizes were awarded to participants who successfully answered questions asked about the presentations. Participants were broken down into groups to facilitate tours of the Electronics and Civil Engineering Laboratories, which were staggered along with lunch time, to allow everyone an opportunity to see the labs and ask questions. Engineering Classroom B was transformed into an Exhibit Hall, and the visitors were invited in to view the exhibits and demonstrations which were manned and managed by Engineering students. After a three year hiatus due to the Covid-19 pandemic, the return of Engineering Open Day proved to be quite successful with the 2023 staging being our largest in terms of attendance.

### High Schools Visits

The Faculty's Outreach Team led by Dr. Omar Thomas, joined the Mona Campus' Marketing Recruitment and Communications Team as it conducted several high school visits during the academic year. All school visits were conducted face-to-face. Some of the schools visited were: St. Andrew High School (grade 13), Wolmer's High School for Girls (grades 12 & 13), St. George's College, Kingston College, and Immaculate Conception High School.

## TEACHING AND LEARNING

### Taught Graduate Degrees

The Faculty's taught master's degree, the M.Sc. Engineering and Management, entered its second year in Academic Year 2022/2023 with four (4) new students in addition to three returning students enrolled. The programme, which is delivered in collaboration with the Mona School of Business and Management offers practical and theoretical knowledge of modern engineering, along with a solid grounding in management techniques and their application to the field of engineering. The students sat courses in Engineering Project Management, Business Analytics, Financial & Managerial Accounting, Global Supply Chain Management, Quantitative Methods and Statistical Techniques, Strategic Human Resource Management, and discipline specific courses Digital Signal Processing, Advanced Structural Engineering, and Advanced Transportation.

## Summer School

The Faculty of Engineering offered and delivered its second Summer School programme from May 29, 2023 to July 7, 2023. The courses available to the students were ENGR0120 Preliminary Engineering Mathematics I, ENGR0220 Preliminary Engineering Mathematics II, ENGR1180 Engineering Mathematics I, ENGM1180 Mathematics for Engineers I, ENGM1280 Mathematics for Engineers II, MATH2230 Engineering Mathematics II and ENGM2280 Engineering Statistics.

## International Accreditation

The Faculty of Engineering, Mona, submitted the Self-Study document for the Electronics Engineering Program on July 2, 2023, for the ABET reaccreditation. The self-study document contains detailed information on how the Electronics Engineering Program satisfies the eight ABET accreditation criteria. The Criteria are:

- Criterion 1. Students
- Criterion 2. Program Educational Objectives
- Criterion 3. Student Outcomes
- Criterion 4. Continuous Improvement
- Criterion 5. Curriculum
- Criterion 6. Faculty
- Criterion 7. Facilities
- Criterion 8. Institutional Support

ABET evaluators initially planned to conduct a face-to-face site visit from November 12–14, 2023. However, after consultation with the USA Embassy in Kingston, Jamaica, the ABET team decided to conduct a virtual visit. All requested data will be available on a web portal to accommodate this virtual visit.

The Electronics Engineering Programme is the only ABET-accredited programme in the Faculty of Engineering. The faculty was granted this accreditation in 2018. All the other programmes in the Faculty of Engineering are structured to operate using ABET quality assurance measures. Applications will be made to seek ABET accreditation for the other programs over the next two years.

## Faculty Academic Quality Assurance

In an effort to improve our teaching and learning outcomes, three courses were submitted to the Faculty's Academic Quality Assurance Committee (FAQAC) and reviewed and corrected. Each course has been submitted for cross-campus approval from St Augustine, also feedback from both CETL and OOL. These are as follows:

- CENG 1203 – Intro to Geotechnics
- CENG 2202 – Hydrology & Water Resource Engineering
- CENG 1203 – Intro to Geotechnics

All courses were approved on April 17, 2023.

## **ALIGNMENT**

### **RESEARCH AND INNOVATION**

#### **Graduate Research Degrees**

In Academic Year 2022/2023, there were four (4) research focused graduate students enrolled in the Faculty of Engineering. One (1) student was pursuing a PhD and two (2) students were enrolled in MPhil programmes. The students' area of research spanned the fields of Biomedical, Civil Engineering, Electronics and Computer Engineering, and Transportation Engineering.

Students attended a total of thirteen (13) seminars for the 2022/2023 academic year. These presentations exposed graduate students to the varying research methodologies employed by lectures, and were introduced in an effort to broaden the scope of knowledge exchange within the Faculty which was intended to enhance the quality of the research output of the Faculty.

#### **Climate Change and Global Health Conference 2022**

Dr. Roxann Stennett-Brown was invited to attend the Climate Change and Global Health Conference 2022, from November 30 to December 2, 2022, at the FIU Koven's Convention Center, Miami, Florida. This was organized by The Robert Stempel College of Public Health and Social Work at the Florida International University (FIU), in partnership with the Pan American Health Organization (PAHO), the Baylor College School of Tropical Medicine and the University of Wisconsin.

#### **Electric Vehicle Expo**

The Faculty of Engineering was one of the key stakeholders for the Electric Vehicle Expo held on The University of the West Indies (UWI) Mona Campus on November 25, 2022. This event was planned and executed by the Caribbean Centre for Renewable Energy & Energy Efficiency (CCREE) with support from The UWI Mona as partners. For the event, Flash Motors Company donated, installed and commissioned an Electric Charging Station on the UWI Mona Campus. This donation provides significant opportunities for the university's research and development as well as

its promotion in the use of cleaner energy as a part of the global push to reduce the emissions of greenhouse gases. The Faculty of Engineering has negotiated for depersonalized data collected from the proposed electric charger to be made available to the university, for the purpose of research. The electric charging station can also be configured to serve as an income generator for the campus. The electric charger is located outside The UWI Administration building at the centre of the campus.

### Published Research

Published research from faculty members either addressed or were geared towards finding solutions to real problems. Publications from Faculty members were as follows:

- Ellis, L.A., Leon, L.P., and Charran, A.V. (2023), “Investigating the use of Recycled Concrete Aggregates in the Construction of Structural Beams”, *West Indian Journal of Engineering*, Vol. 45, No. 2, January 2023, pp. 4–13; <https://doi.org/10.47412/XRHG1947>.
- Leon, L.P., Ellis, L.A., Martin, H.H., and Fermin, B. (2023), “Dominating Factors of Road Failures: Perceptions of Key Stakeholders in the Small Island Developing State of Trinidad and Tobago”, *West Indian Journal of Engineering*, Vol. 45, No. 2, January 2023, pp. 68–76; <https://doi.org/10.47412/MGBB4897>.
- Ellis, L. A. and A. McPherson (2023), “Impacts of COVID-19 on project constraints and contracts: housing development projects in Jamaica”, International LADR Workshop 2023. October 24–27, 2023 @ Honolulu, HI, U.S.A.

## NATIONAL ENGAGEMENT AND OUTREACH

### Outreach – August Town Youths

The Faculty of Engineering hosted nine (9) youths from the August Town community. Dr. Omar Thomas gave them the overall tour of the facilities. The boys’ mentors, Dr. Swane Gardener, from Kairos Network Ltd., and our Dr. Roxann Stennett-Brown were integral in facilitating this outreach activity. The boys were informed about different disciplines of engineering and were given tours of the Civil and Electronics & Electrical Power Engineering Laboratories. Thanks to our lab technician, Mr. Dennis Douglas, who gave them a tour of the Civil Engineering labs and performed laboratory demonstrations for the boys.

## **AGILITY**

### **REGIONAL AND INTERNATIONAL COLLABORATION**

#### **UWI – UF Collaboration**

In September 2022, the Faculty of Engineering (FoE) sent off their first transfer student to the University of Florida under the UWI-UF collaboration. After completing two (2) years in our Electronics programme in our Faculty, Jordan Hayden successfully transferred to the Herbert Wertheim College of Engineering at the University of Florida (UF) to pursue a B.Sc. Degree in Aerospace Engineering under the UWI – UF Collaboration.

#### **Emerging Leaders in the Americas Program (ELAP) Collaboration Mission**

Dr. Thomas was selected to participate in the Emerging Leaders in the Americas Program (ELAP) Collaboration Mission. As a selected delegate, he travelled with the mission to British Columbia (Victoria, Vancouver, Prince George) and Ontario (Hamilton, Guelph, Toronto) from November 6–12, 2022, and attended the CBIE's Annual Conference, which took place in Toronto from November 13 to 16, 2022. The Collaboration Mission event is sponsored by Global Affairs Canada and organized by the Canadian Bureau for International Education (CBIE). During the trip, Dr. Thomas met with key persons from other institutions with the hope to establish collaborations with their institutions. The theme of the mission was "AI & Innovation".

#### **UPENN Collaboration**

2022–2023 saw the renewal of the Faculty of Engineering's collaboration with the University of Pennsylvania and the return of physical student interaction. A total of ten (10) second-year Biomedical Engineering students were selected to participate in the UPENN Collaboration course ENG 1400 which was offered in Semester 2. There were eight (8) Jamaican based projects, and the students (UWI/UPENN) were required to create working prototypes of their solutions to the diagnosed patient issues. Projects were assigned to groups that comprised a mix of both UPENN and UWI students. The Mona students attended classes presented by UPENN Faculty in real-time via zoom or asynchronously via access to the recordings. Five (5) UWI faculty were involved in this collaboration. Course Coordinator Sasha-Gay Wright, stakeholder for one of the projects, Dr. Davaugh Sanderson; and teaching assistants Danelle Julal, Christina Douglas and Paul Wilson.



### Visit to Binghamton University

A Faculty of Engineering delegation led by the dean, Dr. Adrian Lawrence visited Binghamton University on January 25–26th 2023. Included on the team were Dr. Lindon Falconer, Head of Programme, Electronics Engineering, and Ms. Sasha-Gay Wright, Head of Programme, Biomedical Engineering. The following areas of collaboration were discussed for the:

- Faculty visits and collaboration for research
- Students to have access to online courses (up to 12 credits) delivered by Binghamton University
- Delivery of course modules from BU faculty
- A possible 2+2 program
- Collaborative student projects
- Assistance in establishing a Fabrication lab for prototype development
- Seminar talks delivered by both UWI and BU faculty
- Virtual attendance to BU Research days
- Micro-credential courses for UWI students.