FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT

ANNUAL REPORT
2019

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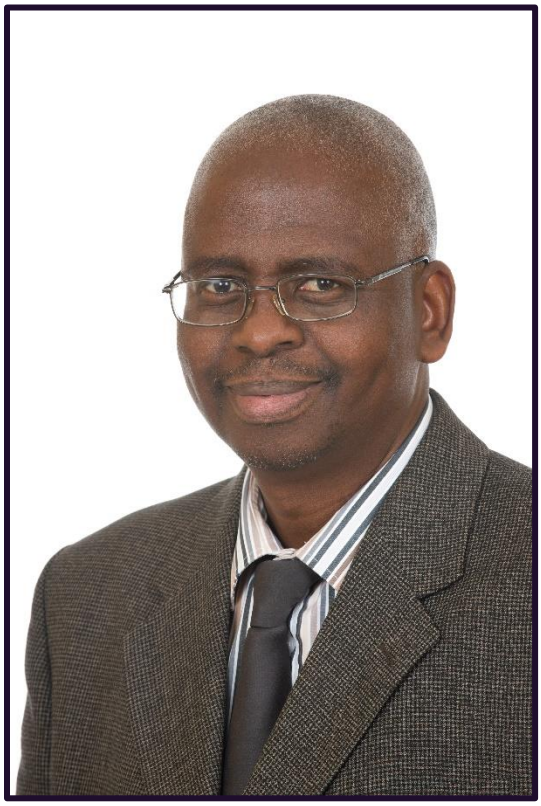


Image 1: Prof Mashao: Executive Dean - FEBE

The 2019 academic year has marked the tail-end of a transformative journey for the Faculty of Engineering and the Built Environment (FEBE). The FEBE of present day is largely unrecognizable when compared to the faculty that existed a mere five (5) years ago. FEBE has completed its transformation into a faculty that has been strategically aligned to respond to the needs of industry, professional associations and the country at large. This change has resulted in the strategic shift taken, geared towards full compliance and alignment to the Higher Education Sub-Framework (HEQSF).

FEBE has therefore positioned itself as an academically current and rigorous faculty that is ready to innovatively cater to the changing higher education needs of a growing number engineering professionals.

At present, the faculty currently grooms young undergraduate professionals across 38 degrees, 22 diplomas (being phased-out) and 18 extended programmes. In addition to this, FEBE sculpts postgraduate students across 12 Honours, 2 Advanced Diplomas, 43 Master's and 21 Doctoral programmes (as at 30 March 2020). This amounts to a total of 156 programmes offered by a formidably renewed faculty.

Armed therefore, with a fully articulated suite of undergraduate and postgraduate offerings, FEBE is looking ahead, eager to shape and inspire the engineering minds of the future.

2. Operating Context

The Faculty of Engineering and the Built Environment (FEBE) has remained one of the largest engineering faculties in country. In comparison to 2018, FEBE has grown from a total of 9,835 students (HEDA, 19 February 2020), to a total student headcount of 10, 181 in 2019. FEBE's strive towards the strategic growth and impact of the Science and Technology (SET) sector at the University of Johannesburg (UJ) has been evidenced by steady growth during a time of substantial change in the Faculty.

FEBE remains home a large contingent of students from both the engineering and built environment disciplines. However, the diversification of the programme-mix within the Faculty has shifted the dramatically over the years, changing therefore the constituency of the student population. Operationally however, the Faculty has remained stable despite a number of integral changes. The Faculty still spans three campuses located at Auckland Park Kingsway (APK), Auckland Park Bunting Road (APB) and Doornfontein (DFC). FEBE also still comprises of twelve (12) individual academic departments, one (1) postgraduate school, seven (7) research centres, two technology stations and one institute. This stable framework has aided in operationally facilitating the shifts in the strategic direction of the Faculty.

Although the Faculty still offers a wide-ranging array of engineering and built environment academic programmes, the programme offerings now reflect more responsively to the needs of professional bodies, industry and the country at large. Three Engineering Science programmes remain stable, located on the Auckland Park Kingsway Campus. The Engineering Technology programmes no longer constitute of a majority of Diploma offerings. In 2019, FEBE ushered in the first cohort of Bachelor of Engineering Technology graduates, who began in 2017. The technology programmes remain located on the Doornfontein Campus. In addition to this, Postgraduate School of Engineering Management is housed at the Bunting Road Campus.

FEBE is operationally supported by two Faculty Administrative Offices based on each of the Auckland Park and Doornfontein campuses. A postgraduate faculty office is also located on the Auckland Park Campus, offering postgraduate administrative support to a growing number of postgraduate students.

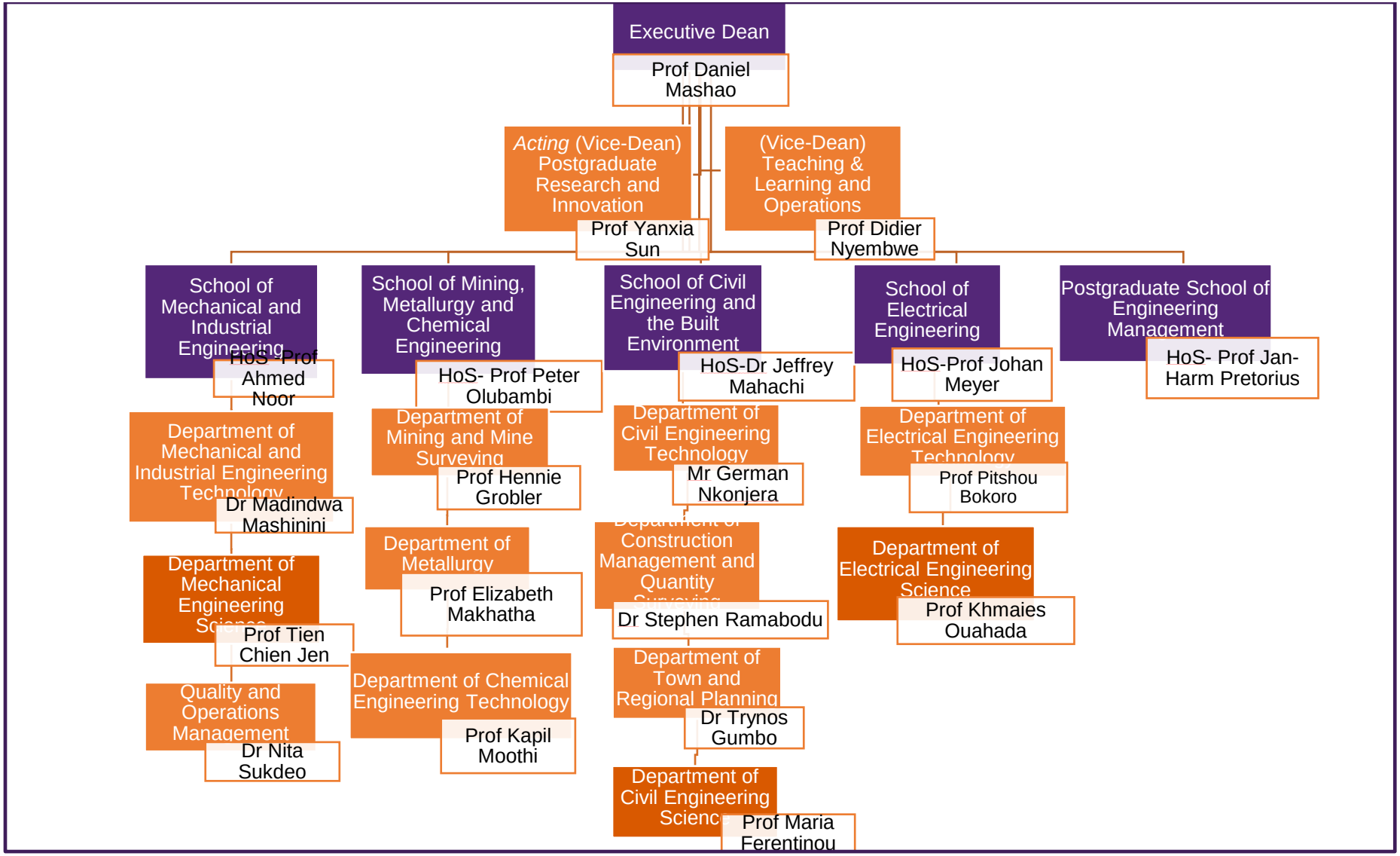


Figure 1: FEBE Organogram (as at 28 March 2020)

3. Governance

FEBE committees include the Technology Programme Committee (TPC) that governs the operational and academic quality of undergraduate technology, built environment and management programmes. The Engineering Science Programme Committee (ESPC) governs undergraduate engineering science related programmes. Further to this, the Faculty Higher Degrees Committee (FDHC) governs postgraduate programmes whilst the Faculty Research Committee (FRC) governs all research related items. Supporting these Faculty-level structures, School research committees also support strategic postgraduate and research initiatives. Governance structures such as Faculty Board and the Faculty Executive Committee has ensured the academic integrity of strategic decision-making processes.

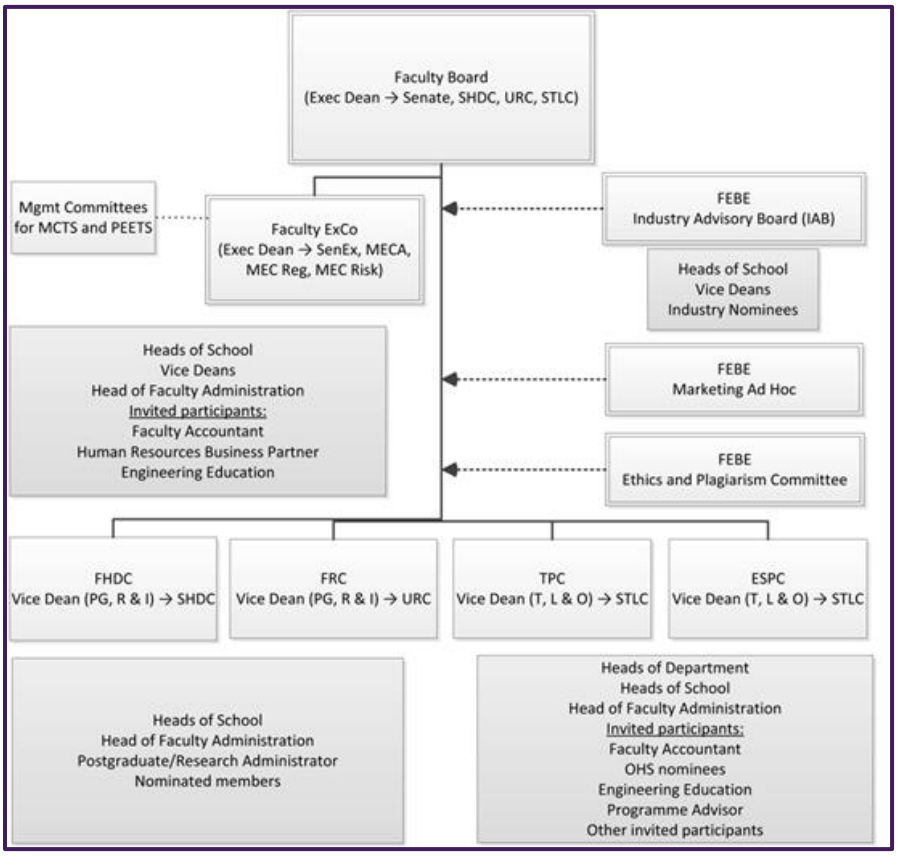


Figure 2: FEBE Governance

4. Programme Quality Management

Eleven (11) of FEBE's twelve (12) departments are affiliated to a professional body. Programme quality management therefore remains integral to FEBE's reputational profile. The intensive preparation towards accreditation visits helps FEBE consistently self-reflect, improve and also highlights programme improvements and challenges. In this way, continuous improvement and development remains a constant and serious endeavor in the Faculty.

The professional bodies associated with FEBE include the Engineering Council of South Africa (ECSA); the South African Council for Planners (SACPLAN); the South African Geomatics Council (SAGC); the South African Council for Project and Construction Management Professions (SACPCMP); and the South African Council for the Quantity Surveying Profession (SACQSP). Professional body visits and accreditation have proved to enhance the quality of FEBE's undergraduate programme offerings and have confirmed the academic integrity of the programmes.

Following a successful interim ECSA visit in 2018, the Faculty undertook preparations towards the Regular ECSA visit in 2020. Intensive preparation in 2019 included two (2) internal Mock Accreditation exercises on the 30-31 August 2019 and the 11-12 November 2019. The Faculty has worked closely with the Centre for Academic Planning and Quality Promotion (CAPQP) who has supported the faculty with evidence compilation and report writing oversight and guidance.

Image 2: FEBE PROFESSIONAL BODY AFFILIATIONS

5. Faculty Risk Management

FEBE actively monitors various risks included in the Faculty's Risk Register, which appears as a standing item on the Faculty Executive Committee (FExco) agenda. One of the major risks identified in 2019 related largely to the potential loss of professional accreditation for the majority of FEBE programmes. Professional Body accreditation of FEBE undergraduate programmes has and continues to feature as a major risk for faculty and it is therefore monitored and supported by the executive management of the Faculty.

The Vice-Dean: Teaching and Learning, Prof Didier Nyembwe, offers direct oversight to mitigate this risk for the various professional programmes. Given the high number of undergraduate programmes being reviewed in 2020 and beyond, a number of strategic and administrative support interventions in 2019 proved crucial towards circumventing risk. Monitoring and evaluation of the accreditation preparation process was therefore actively reported to the FEBE Exco, ensuring consistent and continuous management of the risk.

On the local front, however, given the new stream of programme offerings, it has emerged that FEBE's re-branding process requires greater focus. FEBE's new role in the context of scarce skills development within South Africa, together with the new ECSA-related programme standards, appear unfamiliar to the majority of potential students and to the industry. The Faculty has therefore intensified its focus on building and maintaining more integral relationships with industry and professional bodies. Engagement and information sharing has begun, expanding from Industry Advisory Board meetings.

FEBE's active Advisory Board also helps the faculty maintains a solid link to industry demands and the engineering and built environment profession. In this way, key networks also form an important tool that mitigates risk for the faculty.

Image 3: FEBE Industrial Advisory Board

6. STRATEGIC FOCUS AND TARGETS

6.1 Teaching and Learning in the era of 4IR

The Fourth Industrial Revolution forms the over-arching strategy that permeates across all six (6) UJ strategic objectives. Each school and in turn, each department has made significant contributions towards the advancement of the Fourth Industrial Revolution in the Faculty. In line with the University's vision to position itself as the University of the 4IR in South Africa, FEBE has conducted various 4IR activities in the realm of Teaching and Learning.

Image 4: Prof Mashao hosting the FEBE AI Roadmap Event on 01 November 2019

A thorough effort was made to integrate appropriate concepts of the 4IR in academic modules offered in the Faculty. Several short learning programmes (SLP) addressing 4IR technologies and business models were developed in 2019 and implemented in the Faculty after due approval by Senate.

Public lectures and conferences were also organised at FEBE with the participation of international experts and speakers, who addressed FEBE students in particular, and UJ students in general. The 4IR also permeated FEBE pedagogy with the use of innovative teaching and learning technologies such as virtual reality and three-dimensional printing. These tools will expand to future academic programmes in 2020.

The Chairman of Council of the University of Johannesburg, also the CEO of Seriti Resources, South Africa, Mr Mike Teke, delivered a lecture to the students of the Department of Mining Engineering and Mine Surveying on 22 July 2019, at the start of the new semester. Mr Teke presented the state of mining in relation to the fourth industrial revolution (4IR).

Image 5: Audience of the public lecture on Mining and the Fourth Industrial Revolution presented by Mr Mike Teke

Table 1: Examples of Departmental 4IR Interventions and activities in FEBE in 2019

SCHOOL	SAMPLE OF 4IR INTERVENTIONS
1. **Civil Engineering and the Built Environment**	• Technical Proposal to Senior Management of Gauteng Department of Transport (GDRT) (22 May 2019) FOCUS: Development of Next generation roads / Smart / Instrumented Pavement for Continuous Monitoring of structural health and wireless integration Planned (September 2019) • Presentation of Technical Proposal For SANRAL Pavement Chair to South African National Agency, Topic : Pavement materials and Pavement Engineering for Smart Cities • Urban Planning: Improved and better use and understanding of Big data, building information modelling, innovations in mapping within relevant modules such as transportation, architectural design, drawing and geographic information systems.
2. **Electrical and Electronic Engineering**	• Recognition for most 4IR inclined paper for postgraduate students • 4IR related Publications in conference proceedings and ISI Journals • BEngTech 3rd year 4IR projects • Electrical Engineering Postgraduate Symposium (EEPS 2019) – Energy and the 4IR
3. **Mechanical and Industrial Engineering**	• 3-D printing and Scanning for design prototypes • Automation and Programing • Optimizing Industry challenges in the form of projects
4. **Mining, Metallurgy and Chemical Engineering**	• Mining - The Digital Twin: With available funding the project has the vision to develop a Mine Simulation (the Sibanye Stillwater Simulacrum) which will be used both in undergraduate teaching as well as research in the development of mining technologies within the industry 4.0 drive. The mine emulation will be a test base for Mixed Reality (MR) using a combination of a traditional mine simulation including a tunnel, mine shaft and related infrastructure combined with virtual reality

	applications and real-time data displays linked to points of importance within the Simulacrum.
5. **Postgraduate School of Engineering Management**	• Digital Water (Johannesburg Water), MOU signed. Await contract for research • Keynote (Johannesburg water) Digital water. JW conference • Food and Beverage SETA and 4IR (Contracting T&C) • Digital Healthcare research: UJ Johns Hopkins • Digital business and triple bottom line (UJ and Wayne State) • 4IR and Business (Lithuania, Keynote and research collaboration) • IoT and Petrochemical (Russian collaboration: Keynote at 4IR and petrochemical conference) • UJ 4IR Centre in Soweto

6.2 UJ – FEBE STRATEGIC OBJECTIVES

The strategic objectives of FEBE are aligned to the six (6) strategic objectives of UJ. These continue to emphasise a focus on research and innovation, excellence in teaching and learning, growth and enhancement in Internationalisation, a drive towards enriched student learning and living experiences, the management of FEBE's national and global profile and the Faculty's fitness for global excellence.

FEBE's strategic trajectory has shifted dramatically over the last four years. In response to the national phasing out of non-aligned Higher Education Qualification Sub-Framework (HEQSF) programmes, the programme-mix of FEBE is radically different to that of five (5) years ago. In this regard, FEBE's strategic focus and targets have adapted accordingly, whilst still striving towards the strategic goals of the University.

6.2.1 Objective 1: Excellence in Research and Innovation

Image 6: FEBE Postgraduate Induction

The Faculty actively promotes a culture of excellence in research and innovation. FEBE's drive towards increasing its research footprint can be illustrated by the growing number of publications annually produced. FEBE academics have continued to actively participate in various conference panels, as reviewers, session chairs and organising committees of local and international conferences. FEBE Schools have also successfully hosted international peer-reviewed conferences, extending the Faculty's research footprint and impact globally.

FEBE's research output units submission status currently stands at 730.92 units (as at April 2020). This mammoth achievement and solidified FEBE's upward trajectory of research output units. In comparison to other faculties, FEBE now leads in this key area.

In 2019, FEBE was also home to 41 rated researchers and 72 postdoctoral fellows. FEBE hosted approximately eleven (11) public lectures that covered a vast array of pertinent engineering and built environment related issues. Most lectures related to the Fourth Industrial Revolution (4IR) and its diverse impact on the Engineering and Built Environment sectors.

In addition to the research culture of staff, FEBE's strategic intent to grow postgraduate enrolment numbers, in line with the UJ postgraduate growth strategy, has been significant with a notable increase in the number of postgraduate headcounts. The postgraduate student headcount grew from 979 in 2017 to 1 240 in 2019. (HEDA, HEMIS 21 February 2020).

Despite the challenges of the increased teaching workload, given the phasing out and phasing in of new programmes, FEBE has successfully contributed towards the research objectives of the University. The Faculty also remains committed to the strategy that research-led teaching proves more beneficial towards both research and innovation and teaching and learning.

6.2.2 Objective 2: Excellence in Teaching and Learning

Image 7: FEBE Dean's Honour Roll 2019 on 19 August 2019

FEBE has worked towards excellence in tailoring the Faculty's intellectually rigorous curricula in response to the key strategic objectives of the University and the country at large. Given the current national response towards aligning programmes to the HEQSF, teaching and learning initiatives have needed to be responsive, adaptable and flexible, whilst still maintaining a strong hold on academic integrity.

Two important moments with regards to Teaching and Learning in FEBE are without doubt the graduation of the first students cohort of the eight (8) Bachelor of Engineering Technology programmes started in 2017, and the phasing out of the NATED National Diplomas. A teaching plan was put in place to deal with pipeline students until the year 2020, corresponding with the expiration of the NATED programmes accreditation status by the Engineering Council of South Africa (ECSA).

The process of dealing with the National Diploma pipeline students while offering the BEng Tech programmes resulted in an increase of teaching workload in the Faculty especially in Technology Departments. This situation required a closer working relationship between Faculty Administration, the Deanery and Heads of Department to be managed. In the quest for teaching excellence and continued student support, FEBE rose to the challenge of trying to accommodate and support as many students towards the completion of their studies, within the stipulated rules and regulations of the University.

FEBE's Teaching and Learning Strategy includes a number of cohesive initiatives that holistically support and guide both students and academics. These initiatives discussed below include FEBE First-Year Seminar, Tutorship and Mentorship programme, FEBE writing Centre, Scholarship of Teaching and Learning and the Integrated Student Success Initiative.

Image 8: Department of Metallurgy- Student trip to Rio-Carb

6.2.2.1 First Year Seminar (FYS)

The FEBE FYS not only allows for interaction between staff and students within the Faculty, but also fosters close linkages to the formal engineering curricula. The FEBE FYS introduces students to their chosen engineering programmes while simultaneously assisting with the development of the academic practices necessary for success in higher education. The 2019 FYS was not only effective, with a large number of FEBE students actively participating, but was also most enjoyable, ending with FEBE's Amazing Race.

6.2.2.2 Tutorship and mentorship

Tutor appointments offers integral learning support across the Faculty, to assist in teaching and learning. These tutors are appointed to work with students in particular modules. The vast majority of modules in the Faculty included tutors as a vital part of teaching and learning. In 2019, 533 tutor appointments were made across 12 FEBE departments, together with four (4) GES Senior Tutor appointments. This is in comparison to 471 appointments in 2018.

6.2.2.3 FEBE Writing Centre

FEBE's Writing Centre forms a critical part of the Faculty's student support initiatives. The Centre offers individualised support and instruction regarding all aspects of academic writing in engineering. The FEBE Writing Centre also offered a writing support initiative where the writing consultants partner with several undergraduate research project supervisors to offer intensive and continuous writing support to final-year students during their research project. This includes offering regular individual supervision of the entire research report writing process.

6.2.2.4 Scholarship of Teaching and Learning (SOTL)

FEBE remains active in the area of the Scholarship of Teaching and Learning. In 2019, at least twelve (12) research units were produced in SOTL in Engineering related topics. In support of increased research in this area, two (2) Engineering Education writing retreat days took place in 2019. FEBE participation in the DHET Engineering Education Masterclass series was significant, both in the organisation and participation thereof. FEBE also sent a strong delegation to Research in Engineering Education Symposium (REES2019) held in Cape Town.

6.2.2.5 Integrated Student Success Initiative

The Faculty continues to achieve a good overall undergraduate student success rate as most of the indicators were improved in the academic 2019 compared to 2018. This is the result of various teaching and learning initiatives ongoing in the Faculty. In particular, FEBE continued to participate in the Integrated Student Success Initiative (ISSI). This is a strategic initiative of the University steered by the Academic Development Centre (ADC) aimed at increasing the pass rate of priority index modules in order to increase the number of students who complete their qualifications in minimum time plus one year.

Image 9: FEBE Executive Dean with Vice-Deans at the 2019 FEBE Dean's Honour Roll

Various academic interventions were devised and implemented for identified priority modules in the Engineering Science and Technology programmes, which lead to a significant increase of pass rates in the modules concerned. Another ongoing initiative in the Faculty, to improve student success in 2020, included the use of teaching technologies such as e-books and blackboard.

The Faculty also participated in the first student research conference of the University late October 2020. This initiative was aimed at introducing students to the world of research, which was particularly important to FEBE, in preparation for the introduction of Bachelor of Engineering Technology Honours programmes in 2020.

6.2.3 Objective 3: International Profile for GES

Image 10: Africa by Bus 2019 – Namibia

FEBE strives to be a Pan-African centre of critical intellectual inquiry through extensive scholarship and balanced participation in knowledge networks both within and external to the continent. FEBE's global reach and impact is evident by the number of international staff and students the Faculty attracts. FEBE has significantly contributed towards supporting the University's vision to be an international university of choice. In 2019, of FEBE's total headcount of 10, 181 students, 1, 244 students were international, (HEDA Dean's KPI Report, 04 February 2020). In addition to this, FEBE is also home to 64 international staff (HRIS, 31 Dec 2019).

In collaboration with the internationalisation Office, FEBE has enriched its international profile by successfully completing its third Africa by Bus excursion that took place from in July 2019. Both undergraduate and postgraduate students were registered for an all-expenses paid academic and cultural excursion to Windhoek, Namibia.

Image 11: FEBE students visit Namibia

The trip consisted of 48 postgraduate and undergraduate students across all 12 FEBE departments, 4 chaperons and 2 drivers which amounted to a total number of 54 people.

The students visited the Namibia University of Science and Technology (NUST) where they visited their relevant departments and were exposed to how their different disciplines operated in Namibia.

Enhancing FEBE's global reputation, the conferral of Honorary Doctoral Degrees to President Xi Jinping of the People's Republic of China, Prof Phillip L. Clay and Prof Romain Murenzi, was presented. In addition to this, over twelve public lectures, aligned to the institutions 4IR positioning, were successfully presented by renowned international speakers.

FEBE has remained committed towards the internationalisation of its student population, staff and academic collaborations.

Image 12: Civil Engineering Science Workshop presented by Miklas Scholz, Lund University: Sweden

6.2.4 Objective 4: Student-friendly Living and Learning Environment

Image 13: FEBE LAB - APK CAMPUS

As part of FEBE's accreditation preparation planning, the Faculty strove to ensure that student living and learning spaces were suitable, complying with health and safety regulations. As such, the Faculty was able to maintain and ensure health and safety compliance, which has undoubtedly proved to enhance the teaching and learning environment.

In particular, FEBE continued with the project of upgrading of its venues. In 2019, FEBE undertook Phase 2 of its audio-visual (AV) upgrade on the Doornfontein Campus. In particular, laboratories in the Department of Mining and Mine Surveying were upgraded. Phase 3 of this project continues in 2020, across the Auckland Park campus as well. These upgrades seek to enhance the student-learning environment that facilitates the improved learning experiences of students.

Departments continued to strive towards enhancing learning areas for students. In particular, the Department of Urban and Regional Planning progressed towards equipping its computer laboratory for operational use by students. In the Department of Mining Engineering and Mine Surveying, Mine Design and Resource Estimation computer laboratories completed a successful upgrade. The Department also received a donation of 10 Oculus Quest and 3 HTC VIVE Virtual Reality headsets for the development of VR training for undergraduate students, innovatively enhancing the student's learning environment.

6.2.5 Objective 5: National and Global Reputation Management

Image 14: Australia South Africa Alumni Association /FEBE Girls Varsity Seminar

6.2.5.1 National Reputation Management

Given the focus on re-branding and a number of new undergraduate programmes, school outreaches featured strongly in 2019. Extensive community and industry engagement has continued to feature strongly on the FEBE calendar. A number of interactive student events enhanced the local and international standing and awareness of the Faculty and the discipline during 2019. FEBE participated in a number of community and stakeholder engagements throughout the year. FEBE actively maintains and builds its societal and industry networks thus enhancing the faculties profile through community uplifting endeavours.

Three hundred high school girls were hosted for an on-campus seminar presented in partnership with the Australia South Africa Alumni Association. This initiative dually illustrates FEBE's commitment to school outreach and the rise of women in engineering.

In 2019, FEBE engaged in collaborative marketing partnerships with the institutions Student Marketing unit, Alumni office and other divisions (PsyCad and UJ's Soweto Science Centre and other internal ad-hoc requests) in order to exploit the avenues utilised to reach the institutions desired niche and recruit prospective students for the Bing and BEng Tech programmes. In support of the institutional goal of reaching targeted schools in the two lowest quintiles; FEBE coordinated engagements with schools in Gauteng, North West, Mpumalanga and Limpopo provinces. Both high and low quintile schools were visited.

Image 15: FEBE Marketing Co-ordinator Precious Maputle at a School Visit

FEBE participated in the launch of St Barnabas and UJMET as Specialisation Schools in High Tech and Innovation by MEC Panyaza Lesufi. 5 FEBE departments also successfully participated in a LEAP Science and Maths School engagement.

Internal stakeholders included the Postgraduate school, the Library and Internationalisation office. FEBE's commitment to industry outreach was evident by a key industry engagements with Penetron SA, Schneider Electric, Tetrapak, Jurumani Solutions, Glencore and Facebook.

Over 12 000 Grade 11 and Grade 12 learners from some of the institutions top 500 priority schools were reached through (but not exclusively) the Perfect Life Career Expo programme. The learners were from 77 Schools in Pretoria, East Rand and Johannesburg. Furthermore, FEBE participated in the launch of St Barnabas and UJMET as Specialisation Schools in High Tech and Innovation by MEC Panyaza Lesufi. One LEAP Science and Maths School engagement with participation from 5 departments from the faculty was coordinated successfully.

Image 16: Future Talent Program presented by Tetrapak

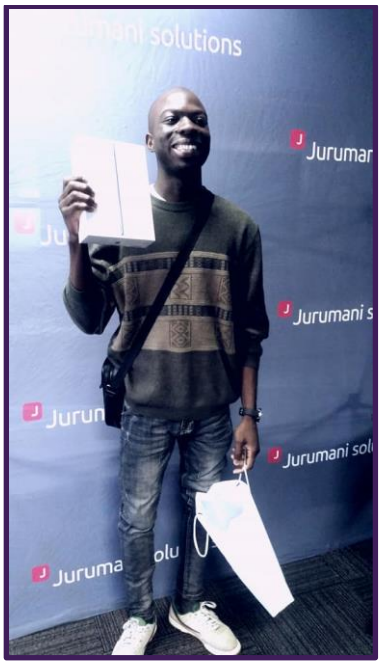


Image 17: Recruitment drive with Juramani Solutions

In an effort to reach and secure student recruitment, over 35 bursary and scholarship opportunities were profiled and circulated across all feasible communication platforms. FEBE continues to enjoy increased social media following with a 5-star rating across Twitter, YouTube and Facebook.

The Department of Quality and Operations Management hosted the Annual National Quality Forum. The strategic event assisted with benchmarking the department's programmes to that of peer institutions, sharing of best practice whilst promoting relationship-building that would lead to greater collaboration.

Image 18: National Quality Forum (UJ – STH)

6.2.5.2 Global Reputation Management

FEBE is active in extending its reach, influence and networks globally. International collaborations enhance the faculty's global reputation. In the 2019 academic year, FEBE has continued to make its presence known at strategic international events and prioritizing collaborations with renowned international institutions and academics.

Image 19: Public Lecture by Professor Wang titled: 4IR: 3-D Printing Materials from Solid Waste

A number of public lectures, workshops and conferences enhanced FEBE's global reputation strategy. Drawing together academics from all parts of the world, FEBE hosted various academics who presented on a wide array of engineering and built environment topics. FEBE has worked tirelessly to maintain strong networks throughout the world, enriching not only the student experience but also forging ahead with new ideas and innovative solutions in various fields.

Table 2: FEBE - List of Public Lectures 2019

Guest	Title	Date
Public Lecture by Dr Lynn Ilon, a global knowledge economist	A Paradigm Shift for Engineering: Using Knowledge Economics to Tackle Poverty.	14-Mar
DFC library in collaboration with FEBE Seminar by Ronnie Siphika	The Construction Industry in the fourth Industrial Revolution: Is this the Future?	09-Apr
Public Lecture by Prof Phillip L. Clay	Issues of Development & Redevelopment (Town & Regional Planning)	27-May
Public Lecture by Prof. Hilary I. Inyang	Global Sustainable Development: Technical and Policy Instruments"	30-May
Prof. Fernando Buarque de LIMA NETO, DIC Ph.D. Avah SM-IEEE (University of Pernambuco, Brazil	Computational Semiotics - A Primer	12-Jun
SAAE Lecture by Dr Gustav Rohde	The 4th Industrial Revolution: Digital Transformation: An Opportunity to Reposition - Dr Gustav Rohde	07-Jul-19
Department of Mining Public Lecture by the CEO of Seriti Resources, South Africa Mr Mike Teke	The state of mining in relation to the fourth industrial revolution (4IR).	22-Jul-19
Public Lecture on Additive Manufacturing (3D Printing) by Professor Behrokh Khoshnevis	Additive Manufacturing (3D Printing) for fabrication and assembly applications in the construction of human settlements	01-Aug
Prof. Mohsen Farahat and	Bio-Mineral Processing: Fundamentals an Applications by Prof. Mohsen Farahat and	07-Aug
Prof. Ahmed Elmahdy	Frothing in Flotation by Prof. Ahmed Elmahdy	
Distinguished Public Lecture by Prof Kees A.S. Immink and Prof Han Vinck	From carving in stone to writing in DNA: History and Future of Data Storage by Prof Kees A.S. Immink	30-Aug
Prof Han Vinck	Models, Concepts and Applications of Information- and Communication theory by Prof Han Vinck	
Talk in the department of Electrical Engineering Technology by Professor José M. F. Moura.	Research Talk: Data (Big), Computing (Fast), and Algorithms (Learning) – The New Opportunities For a Bright Future	01-Oct-19
Seminar presentation by Dr. Alexander Eduardo Caytuero	the Use of Mossbauer Spectroscopy in Mineral Processing and Value Addition	03-Oct-19

Public Lecture by New York-based criminologist Renee Cummings	Public lecture on Diversity, Digital Identity and AI Citizenship in the 4IR	04-Oct-19
Public Lecture by Vice-Chancellor and Principal of the University of Johannesburg Professor Tshilidzi Marwala	John Orr Memorial Lecture	07-Oct-19
Public Lecture by - Dr Angelique Janse van Rensburg	The Lilium Electric Air Taxi (Flying car…no way!)	09-Oct-19
Public Lecture by Prof Wenlong Wang	Complementary Utilization Of Industrial Solid Wastes To Prepare High-Performance, Green Materials	02-Nov-19
Public Lecture by Xingxing Cheng	Investigation on catalytic NO reduction by CO for flue gas with excess oxygen	03-Nov-19

Table 3: FEBE Workshops and Conferences

Description	Title	Date
DFC Library in partnership with FEBE writing Workshop	How to Publish - Using FEBE standards	27-May-19
Executive BIM training by The Centre of Applied Research and Innovation and the Faculty of Engineering & the Built Environment	BIM Management – Working with BIM models	16 -17 July 2019
CIDB Postgraduate Conference	The Construction Industry in the 4th Industrial Revolution	28 - 30 July 2019
Workshop by Elsevier Engineering Solutions.	Fostering Success in the classroom & Beyond	09-Sep-19
SKA 2020 funding workshop presented by Ms. Fezisa Mlambisa (South African Square Kilometre Array)	Funding	12-Sep-19
Half – Day Workshop, Presentation by Miklas Scholz	"The Role of Constructed Wetlands as Part of the Ecological Infrastructure to Attenuate Flooding and Improve Water Quality"	07-Nov-19

FEBE coordinated a tour and presentation of the faculty in partnership with the internationalisation office for forty five (45) learners from Soofia International School in Lesotho.

Image 20: FEBE Hosts the Soofia International School, Lesotho

6.2.6 Objective 6: Fitness for global excellence and stature (GES)

Image 21: FEBE Staff at the Launch of the Institute for Intelligent Systems

Illustrating FEBE's commitment and fitness for global excellence, the Institute for Intelligent Systems (IIS) was launched formally during 2019. IIS is actively involved in creating new knowledge in different areas of 4IR through publications in books, reputable journals, conferences both nationally and internationally. In doing so, the IIS has been actively involved in driving various initiatives aligned to the fourth industrial revolution throughout 2019. IIS has collaborated and worked closely with various industry partners and government agencies such as Nedbank, Department of Planning Monitoring and Evaluation (DPME), Sugar Milling Research Institute (SMRI) among others.

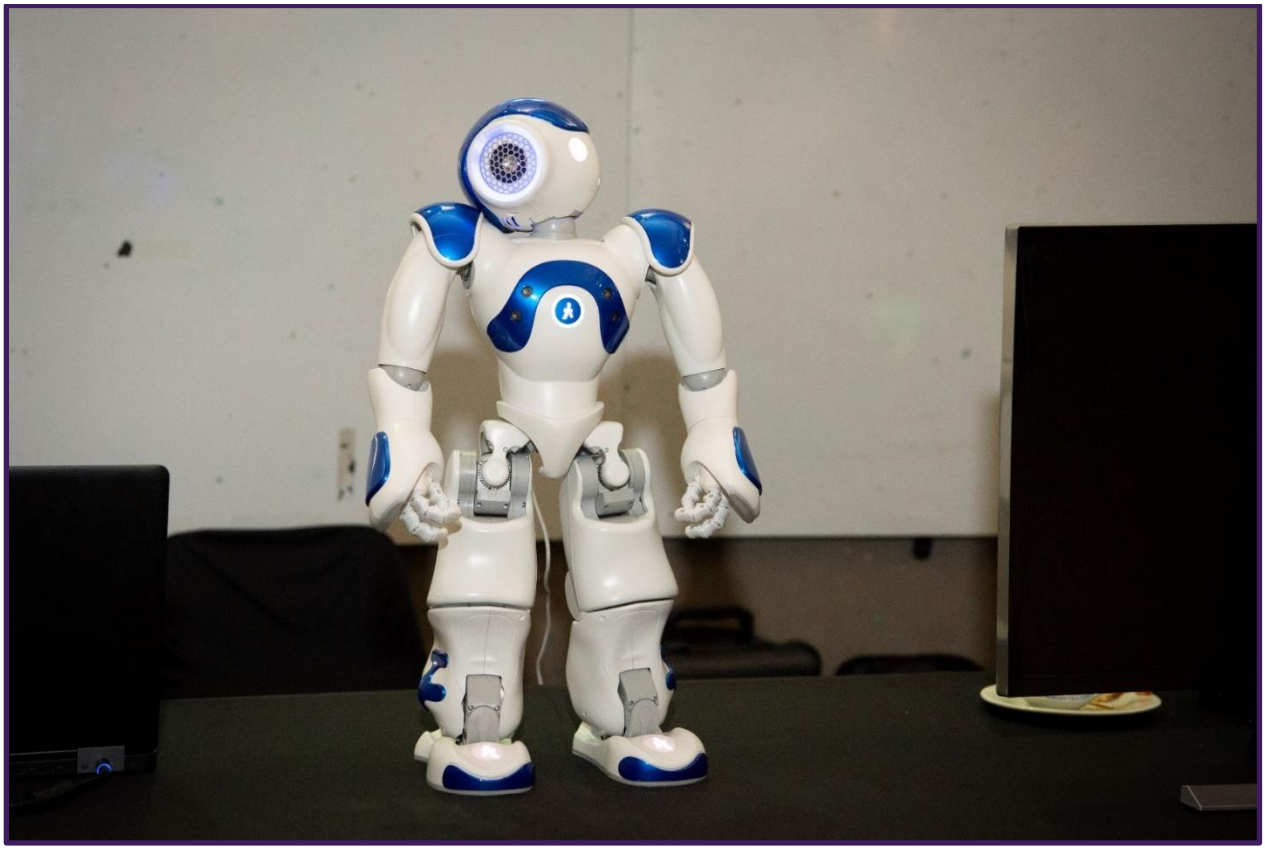


Image 22: Robot powered by AI

The institute has also collaborated internally to develop online and contact courses on topics related to 4IR. The IIS has played an active role nationally through participation in panel discussions and delivering keynote addresses on 4IR to socialize the concept. On the

internationalization front, IIS is successfully developing international and Pan-African collaborations. The institute has also successfully developed prototypes of 4IR technologies.

The Faculty has continued to enthusiastically adopt and utilise social media platforms as these allow for targeted and insight-driven promotional strategies. All social media activity undertaken complies with the institution's social media guidelines. Insights indicate increased engagement levels with a niche user profile ranging from varying engineering disciplines, industry practitioners, sponsors, partners, students and staff. These avenues have proved critical towards growing FEBE's fitness for global competition and awareness.

FEBE Marketing has ensured FEBE's presence on a number of global platforms in keeping with UJ social policy. These include increased number of Facebook (8 148 following), 879 Twitter followers, 316 Youtube subscribers. 9 promotional programme-related videos were uploaded in 2019, in addition to others already present on YouTube.

7. EMPLOYEE PROFILE

As at 31 Dec 2019, the Faculty employed 273 staff members. This comprised of 175 academic, 54 technical and 44 support staff, with 64 members of staff being international. (HRIS, 31 Dec 2019). This shows a slight increase form 267 staff members employed at the end of 2018.

Table 4: FEBE Academic Employee Profile by Category and Rank (HRIS as at 31 Dec 2019)

Academic	Research Professor	Associate Professor	Professor	Senior Lecturer	Lecturer	Assistant Lecturer	TOTAL
DEP OF CHEMICAL ENGINEERING TECHNOLOGY	0	3	0	3	1	3	10
DEP OF CIVIL ENGINEERING SCIENCE	0	4	1	4	5	0	14
DEP OF CIVIL ENGINEERING TECHNOLOGY	0	1	0	3	6	1	11
DEP OF CONSTRUCTION MNGT & QUANTITY SURVEYING	0	1	2	1	4	1	9
DEP OF ELEC & ELEC ENG SCIENCE	0	5	2	6	1	1	15
DEP OF ELECTRIC ENG TECHNOLOGY	0	1	0	8	11	0	20
DEP OF MECHANICAL ENGINEERING SCIENCE	1	1	4	8	0	1	15
DEP OF MECH & IND ENG TECHNOLOGY	0	2	0	8	14	0	24
DEP OF METALLURGY	0	3	2	4	6	1	16
DEP OF MINING ENG & MINE SURVEY	0	2	0	2	10	0	14
DEP OF QUALITY & OPERATION MGT	0	1	1	3	4	2	11
DEP OF URBAN & REGIONAL PLAN	0	2	0	0	6	0	8
POST GRAD SCHOOL OF ENG MANAGEMENT	0	2	1	1	0	0	4
DEAN'S OFFICE	0	1	0	1	0	0	2
TOTAL	**1**	**29**	**13**	**52**	**68**	**10**	**173**

7.1 FEBE Staff Awards, Recognitions and Achievements

Staff recognition has featured strongly in the faculty. The Staff Awards event held in 2019 proved to illustrate FEBE's commitment to valuing its staff and their invaluable contributions towards both teaching and research initiatives.

Image 23: FEBE Staff Awards 2019

7.1.1. Faculty Awards & Achievements

Community Engagement projects in the Faculty of Engineering and the Built Environment won two first prize awards on Thursday, 23 May 2019 in two separate award ceremonies. These projects were conducted with our Electrical and Electronic Engineering Science partner, Schneider Electric.

The first prize award went to The Steel Engineering Industries Federation of South Africa (SEIFSA): Best Corporate Social Responsibility project for the Isiboniso School Project, with the

second prize awarded for the FSASEC. The other award went to The French South African Chamber of Commerce and Industry (FSACCI): Best Business Collaboration France/South Africa. This event was attended by various dignitaries, including the former President Kgalema Motlanthe, and the Minister of Arts and Culture, Nathi Mthethwa, together with the French Ambassador and CEO's of French Enterprises in South Africa, H.E. Christophe Farnaud. Congratulations to Prof Johan Meyer, the leader of the projects, and the entire team that works hard to make these efforts successful.

Image 24: Prof. Johan Meyer (Head of School: School of Electrical Engineering) and Mr. Cornay Keefer (Project Manager: School of Electrical Engineering) at the SEIFSA Awards

- Prof Mbohwa elected new Fellow of ZAS at the 2018 Annual General Meeting held on 30th March, 2019
- Prof TG Swart was selected for the IEEE life membership
- Dr. Tebogo Phetla Mashifana and Prof. Kapil Moothi (Department of Chemical Engineering Technology) were nominated and shortlisted for the Mail and Guardian 200 Young South Africans 2019. Dr. Mashifana was also invited as a guest to speak in one of the biggest STEM Conference and Career EXPO on the 4-5 October 2019.

Image 25: Dr. Tebogo Phetla Mashifana

- Prof David Limebeer was nominated at the Honeywell International medal of the Institute of Measurement and Control.
- NSTF-Lewis Foundation Green Economy Award Nomination - (UJ-PEETS) Technology Station Manager: Ms Nicoleen Janse van Rensburg, University of Johannesburg 'For enabling technology transfer and interaction between academia and SMMEs to stimulate and support technology innovation in the green economy by providing subsidised engineering services to SMMEs in the green economy.
- Dr. Banothile Makhubela - Department of Chemical engineering science was nominated at the 2019 South African Women in Science Awards.
- Dr. Anton Maneschijn, senior lecturer in mechanical engineering design at UJ has received funding from UJ for an aeronautics research project and was invited to

share in the AeSSA Annual Conference 2019 about his research on the aeronautical environment. http://tiny.cc/4xhaez

- Former FEBE Executive Dean, Prof Saurabh Sinha – Elected to be a member of the Academy of Science of South Africa (ASSAf)
- Prof von Solms (Department of Electrical and Electronic Engineering) was elected to receive the Vice Chancellor has distinguished awards for Teacher Excellence in 2019.

Image 26: Prof von Solms VC Distinguished Award for Teacher Excellence

- Peter O. Olukanmi awarded as one of the best presentations at the Prestigious International Conference on Soft Computing and Machine Intelligence (IEEE's ISCMI 2019).
- Dr Mashifana Tebogo has been featured in the Top 100 Young Independents for 2019.

7.1.2 Departmental Achievements

- UJPEETS, the Water & Health Research Center launched the UJ Mobile Water Lab technology in the most remote areas in Africa to support water quality and health.
- CSIR Principal Researcher Dr Ronald Machaka has been appointed as a visiting associate professor in the Faculty of Engineering at the University of Johannesburg. Dr Machaka's research interest lies in titanium powder metallurgy, with a focus on metal injection moulding processing.
- Department of Urban and Regional Planning hosted Prof Clay and took him to an excursion to Soweto, Vilakazi Street on 27 May. Prof Clay is widely known for his work in U.S. housing policy and community-based development and has been involved in several studies that received national attention, he is the former Massachusetts Institute of Technology (MIT) Chancellor and Professor of Urban Planning.
- The Department of Urban and Regional Planning had a prize giving ceremony on 23 April 2019. This event honoured students for academic excellence/achievement for the year 2018/2019.
- UJPEETS is supporting the IWA Water in Industry 2020 Conference. The conference will take place in Nanjing, a vivid historical heritage of China, from 30 March to 2 April 2020.
- The National Science and Technology Forum (NSTF) honoured Ms Nickey Janse van Rensburg, the technology station manager at UJ-PEETS, together with her team for their efforts in addressing sustainable, socio-technical systems that enable economic growth, at the NSTF-South32 Awards with the NSTF-Lewis Foundation Green Economy Award on Thursday, 27 June 2019.

Image 27: Ms Nickey Janse van Rensburg (PEETS)

- Mechanical and Industrial Eng. Technology - won two best track paper awards in the third European IEOM Conference 2019 held at Pilsen during July 23 - 26.

7.1.3 Radio and TV Recognitions

- **702**

  UJPEETS, the Water & Health Research Center launched the UJ Mobile Water Lab technology in the most remote areas in Africa to support water quality and health.

- **John Maytham Show – Cape Talk**

  Deon Kruger PrEng Invited to talk on the John Maytham Show.

  South Africa's first "plastic road" - is it the answer?

- **IKwekwezi FM Radio**
  Prof Thwala - Interview on Construction Management & Quantity Surveying at UJ (24 May 2019)

- **Aganang FM Radio Interview**
  Mrs Ntebo Ngcbo on Civil Engineering Technology with Thabo Leping (30 May 2019)

- **Engineering Week with UJ FM**
  FEBE Heads of different Departments share more information about the New BEng Tech programmes from the 8th -12th April 2019

7.2 Staff Development

FEBE remains committed to staff development and training. With regards to the academic employee profile of the Faculty, 90 academic staff members hold doctoral qualifications, (HEDA Staff Headcount Cube, 19 February 2020). FEBE remains committed towards increasing this number in the near future.

Faculty oversight regarding the monitoring of the completion of qualifications has assisted in this process. FEBE has committed itself to growing its own timber, by actively supporting staff towards promotion opportunities. The faculty recorded a total of 6 promotions in the 2019 year, (HRIS as at 31 Dec 2019).

FEBE is supported by, not only a strong professional support staff but also by a significant number of technical support staff. Both these categories of staff prove invaluable to the academic endeavor, each with their own specific skill-set that compliments both teaching and research initiatives. FEBE notably exhibits a strong mutual respect between academic and professional support staff. In this manner, the Faculty has been able to deal with challenges effectively, for the benefit of the faculty and student body.

Table 5: Academic Staff Qualifications (as at Feb 2020)

Staff Headcount	**Qualification type**	**Other**	**Grand Total**
Organisational Department	**With Doctoral**		
APB Quality & Operations Management	4	7	11
APK Civil Engineering Science	8	6	14
APK Electrical & Electronic Engineering Science	14	3	17
APK Engineering & the Built Environment Dean's Office	2		2
APK Institute of Intelligent Systems	1		1
APK Mechanical Engineering Science	14	1	15
APK Postgraduate School of Engineering Management	4		4
DFC Chemical Engineering Technology	6	5	11
DFC Civil Engineering Technology	2	9	11
DFC Construction Management & Quantity Surveying	4	6	10
DFC Electrical Engineering Technology	10	10	20
DFC Engineering & the Built Environment Dean's Office	2		2
DFC Engineering Metallurgy	2	7	9
DFC Extraction Metallurgy	4	1	5
DFC Mechanical & Industrial Engineering Technology	8	15	23
DFC Metallurgy	1	2	3
DFC Mine Surveying	1	4	5
DFC Mining	1	6	7
DFC Quality & Operations Management		1	1
DFC Town & Regional Planning	2	6	8
Grand Total	**90**	**89**	**179**

Table 6: Technical Support Employee Profile by Category and Rank (HRIS as at 31 Dec 2019)

Non Academic (Technical Support Services)	**Technical Assistant**	**Technician**	**Senior Technician**	**Technical Manager**	**Head Technician**	**Station Engineer**	**Total**
DEP OF CHEMICAL ENGINEERING TECHNOLOGY	0	1	0	1	1	2	5
DEP OF CIVIL ENGINEERING SCIENCE	2	1	0	1	1	0	5
DEP OF CIVIL ENGINEERING TECHNOLOGY	3	1	0	1	0	0	5
DEP OF CONSTRUCTION MNGT & QUANTITY SURVEYING	0	0	0	0	0	0	0
DEP OF ELEC & ELEC ENG SCIENCE	2	0	0	1	0	0	3
DEP OF ELECTRIC ENG TECHNOLOGY	0	3	0	0	2	0	5
DEP OF MECHANICAL ENGINEERING SCIENCE	2	0	0	0	4	0	6
DEP OF MECH&IND ENG TECHNOLOGY	0	1	2	0	0	0	3
DEP OF METALLURGY	3	5	3	1	1	1	14
DEP OF MINING ENG&MINE SURVEY	0	1	1	0	0	0	2
DEP OF QUALITY & OPERATION MGT	0	0	0	0	0	0	0
DEP OF URBAN & REGIONAL PLAN	0	1	0	0	0	0	1
DEAN'S OFFICE	0	1	1	0	0	0	2
TECHNO LAB	0	0	0	0	0	0	0
TOTAL	**12**	**15**	**7**	**5**	**9**	**3**	**51**

Table 7: Administrative Support Employee Profile by Category and Rank (HRIS as at 31 Dec 2019)

Non Academic (Support Services)	Executive Dean	Faculty Officer	Financial Officer	Program Advisor	Head of Faculty Admin	Co-ordinator	General Assistant	Secretary	Administrator	Research Assistant	Total
DEP OF CHEMICAL ENGINEERING TECHNOLOGY	0	0	0	0	0	1	0	0	2	0	3
DEP OF CIVIL ENGINEERING SCIENCE	0	0	0	0	0	0	0	1	0	0	1
DEP OF CIVIL ENGINEERING TECHNOLOGY	0	0	0	0	0	0	0	1	2	0	3
DEP OF CONSTRUCTION MNGT & QUANTITY SURVEYING	0	0	0	0	0	0	0	1	0	0	1
DEP OF ELEC & ELEC ENG SCIENCE	0	0	0	0	0	0	0	1	0	1	2
DEP OF ELECTRIC ENG TECHNOLOGY	0	0	0	0	0	0	1	1	0	0	2
DEP OF MECHANICAL ENGINEERING SCIENCE	0	0	0	0	0	0	0	1	0	0	1
DEP OF MECH&IND ENG TECHNOLOGY	0	0	0	0	0	0	2	1	0	0	3
DEP OF METALLURGY	0	0	0	0	0	0	0	1	1	0	2
DEP OF MINING ENG&MINE SURVEY	0	0	0	0	0	0	0	1	0	0	1
DEP OF QUALITY & OPERATION MGT	0	0	0	0	0	0	0	1	0	0	1
DEP OF TOWN & REGIONAL PLAN	0	0	0	0	0	0	0	1	0	0	1
POST GRAD SCHOOL OF ENG MANAGEMENT	0	0	0	0	0	0	0	0	1	0	1
DEAN'S OFFICE	1	11	1	1	1	1	0	1	4	0	21
TECHNO LAB	0	0	0	0	0	0	0	0	0	0	0
Total	**1**	**11**	**1**	**1**	**1**	**2**	**3**	**12**	**10**	**1**	**43**

7.3 Transformation and Equity

Transformation remains a critical imperative of the Faculty. FEBE has employed preferred employment strategies to recruit designated candidates, as far as possible. A review of 2019 new appointments confirms this in that 71 % of new appointments made were that of designated candidates. Overall, the FEBE employee profile is categorised by 59 % designated employees, 18% non-designated and 23 % international employees. (HRIS, 31 Dec 2019).

8. STUDENT PROFILE, STUDENT SUCCESS AND THE STUDENT EXPERIENCE

8.1 Student profile in subsidised academic programmes

FEBE's student profile in subsidised undergraduate programmes has dramatically shifted since the implementation of the new Bachelor of Engineering Technology programmes in 2017. The APS requirement for these programmes is significantly higher than that of the Diploma offerings, which they have replaced. As such, the academic calibre of students registered in the Faculty has risen, registering 455 students with an APS of 35 and greater. This is a significant increase from 326 in 2016, (Dean's KPI Report, HEDA 19 February 2020).

Table 8: FEBE Student Headcount (HEDA, 19 Feb 2020)

YEAR	Student Headcount	FTE Enrolled	FTE Passed	FTE % Pass	Graduates
2019	10,179	5,463.1	4,329.9	79.26%	2,890
2018	9,835	5,019.8	3,844.4	76.58%	2,799
2017	9,398	4,443.0	3,661.5	82.41%	2,406
2016	9,604	4,468.9	3,693.7	82.65%	2,229
2015	9,109	4,178.6	3,397.2	81.30%	1,900
2014	8,663	3,774.6	3,016.7	79.92%	1,888
2013	7,595	3,298.3	2,652.7	80.43%	1,639
2012	7,409	3,239.9	2,474.0	76.36%	1,348
2011	7,534	3,208.5	2,490.6	77.62%	1,388
2010	7,148	3,333.8	2,458.6	73.75%	1,385
2009	7,725	3,513.9	2,629.6	74.83%	1,376

FTE: Full-Time Equivalent

8.2 Student success and experience

For the 2019 academic year, FEBE consisted of 8, 583 undergraduate students and produced 2,186 undergraduate graduates yielding a graduation rate of 25,5 %. The postgraduate student compliment comprised of 1 598 students, 175 graduates at a graduation rate of 11 %, (HEDA HEMIS data, 19 February 2020). These numbers will however increase as the graduation cycle for the 2019 academic years draws to a close. A significant increase in graduates has been noted for programmes that are phasing out. This trend is particularly evident for the Bachelor of Technology (BTech) programmes with 1, 188 in 2018 compared to 1, 335 in 2019 currently. The faculty foresees this trend continuing as the phased out pipeline of students successfully exit these programmes.

FEBE continued to operationalise and implement the phase-out plan of non-aligned programmes in 2019. The process has been challenging, resulting in an increased workload model for academic staff. The higher graduate numbers however indicate that informing students of the looming phasing out has assisted in ensuring that students successfully exit the programmes at an increased rate.

8.2.1Student Achievements

Image 28: SAICE 3rd Prize Winner

- Oluwaniyi Azeez, Materials Engineering Master's Degree Graduate won an iPad at the Industry Talk hosted by FEBE & Jurumani Solutions (Pty) Ltd at the DFC library (17 April).
- First year students, Yolokazi Rono, Cynthia Ramasindi and Abigail Mashaba - first female beneficiaries for Sulzer South Africa bursary opportunity 2019.
- Xolani Mzileni invited as the Guest speaker at the University of Pittsburgh, Swason School of Engineering to Present on Engineering Design for Social Change in Africa.
- Joshua Nhokwara represented UJ and took 3rd prize at the Civil Engineering University Research and Investigation Project hosted by The South African Institution of Civil Engineering (SAICE).
- CIDB Postgraduate Conference best papers award winners.
    a. Student best paper - 4IR Leadership Effectiveness and Practical Implications for Construction Business Organizations - Kehinde Alade and Abimbola Windapo
    b. Academic best paper - Exploring the Quality Management Methods Adopted by Contractors in Fast-Track Construction Projects in Eastern Cape - Fidelis Emuze and Michael Oladokun.
- UJ Civil Engineering Student's Forum(UJCESF) – Hosted a workshop on Entrepreneurial mind-set required to have a fulfilling career, they aim of the workshop was to foster the increase in employability of the graduates from the department of Civil Engineering
- PhD student Mr Rigardt Coetzee was featured in the SAIME magazine with the title of "The Nano-Mechanical Engineering Future".
- Sandile Sithole MPhil Engineering Management student at the Mineral Processing and Technology Research Centre was featured on the KZN Department of Transport (DOT) weekly e-newspaper in relation to the research especially because stakeholder management (in particular Tribal councils and local forums) is a major issue in the KZN province.
- Three UJ students compete globally to produce affordable, clean water solution (15 Global Semi-finalists we were mentored by 6 Ericsson Executives

from. EU, Asia, Middle East and Africa. At the end of the semi-finals stage, we then submitted to Judges at the Ericsson Headquarters in Stockholm, Sweden).

- The Hydrogen Innovation Society will officially operate as the first ECSA Student Chapter as of Friday (18/10/2019). Projects include Solar, hydrogen hybrid car, Shell Eco-marathon, Baja SAE, Formula SAE, Aeronautical
- Two students from our university have been nominated for the MRF scholarships
- Three FEBE students below competed globally to produce affordable, clean water solution. They were short-listed in the Top15.

Image 29: Top 15 Global Semi-finalists mentored by Ericsson Executives

8.3 Relevancy and impact of academic programmes

FEBE received Council of Higher Education (CHE) accreditation for a large number of new and replacement programmes in 2019. FEBE is thus now fully aligned to the HEQSF, offering full articulation with all undergraduate programmes leading to postgraduate studies.

Of the voluminous number of programmes developed and submitted for accreditation from 2016 to 2018, 3 of 3 Advanced Diplomas, 13 of 13 Honours degrees, 3 of 3 Postgraduate Diplomas, 9 of 10 new Master's, 8 of 8 Master of Technology (MTech) replacement Master's programmes were accredited by the CHE. In addition to this, 4 of 4 additional fields of study were approved for the PhD.

The relevancy and impact of the successfully accreditation process is substantial as FEBE has managed to facilitate a challenging transition between non-aligned to fully aligned programmes. During a challenging period of transition nationally, the FEBE suite of new programmes offers seamless articulation pathways all the way up to the doctoral level. This has helped the Faculty maintain stability with regards to its significant contribution towards University enrolment targets in the SET sector. It has also ensured the steady production of engineering and built environment professionals into the employment sector.

8.4 Non-subsidised academic programmes

FEBE offers academic oversight to the Institute of Intelligent Systems (IIS). In 2019, the IIS developed a number of non-subsidised Short Learning Programmes (SLPs) relating to 4IR. In addition to this, the IIS also began development and the approval process for a number of SLPs that would be offered at the UJ Devland site, in partnership with industry. These offerings seek to directly advantage UJ graduates by offering them both theoretical and practical exposure to the use of 4IR in the workplace.

9. RESOURCE MANAGEMENT AND SUSTAINABILITY

FEBE focused its commitment towards the responsible and sustainable management of its resources. In 2019, bi-monthly meetings were held with the FEBE Business Partner, Heads of Schools and Heads of Department. This facilitated stronger relationship building and enhanced effective communication between stakeholders.

Journals for 2019 financials closed on the 23 January 2020. Debit balances were at R4, 551 641 as at 31 December 2018 and R6, 125 775 as at November 2019. In addition to this, it was noted that R1,500 000 was used to aid FEBE researchers with conferences and travel, thus supporting key research and collaborative initiatives.

It was noted that FEBE spent 87 % of its budget in 2019, in comparison to 99 % in 2018. FEBE also undertook to divide its staff development account into more effective workshop and team building activities. Two (2) refresher workshops on the procurement systems and processes were also held for all FEBE secretaries.

10. LEADERSHIP

FEBE experienced a few critical changes in leadership during the 2019 academic year. The Executive Dean of the Faculty, Professor Daniel Mashao continues to be supported by the Vice-Dean: Teaching and Learning, Professor Didier Nyembwe. Prof Clinton Aigbavboa no longer serves as Vice-Dean of Postgraduate Studies, Research and Innovation with Prof Yanxia Sun maintaining an Acting role in this portfolio.

Professor Mashao's respectful leadership style encourages an open and transparent working environment, that supports and builds innovative and collegial working relationships. The value of the people, their talent and capabilities have helped ensure FEBE leads in a number of critical strategic roles.

Image 30: Final Year Female Lunch with the Dean

In light of the retirement of Mrs Elize Maas, FEBE also welcomed a new Head of Faculty Administration, Ms Lungi Bobi, in April 2019. A number of new Heads of Departments were also appointed in 2019. The Faculty has therefore collectively supported and guided new appointments given the urgency of a number of key strategic initiatives taking place.

Image 31: Ms Lungi Bobi – FEBE Head of Faculty Administration

The continuity, professionalism and depth of FEBE leadership has ensured that the Faculty has maintained its trajectory in line with the key strategic objectives of the University. Leaders are present in all areas within the faculty, from academics skilled in the field, to excellent researchers and innovative teachers. Although a large faculty, dedicated Heads of Departments and Heads of Schools hold critical leadership positions that help jointly steer FEBE onward and upward.

11. CONCLUSION AND WAY FORWARD

Having borne a number of strategic initiatives from 2016 to fruition in 2019, the 2019 academic year has offered FEBE a time to reflect and review areas for improvement and strategic growth. A number of challenges were overcome as result of the resilience and dedication of both academic and professional support staff.

FEBE's state of transition of recent years is nearly complete, as staff and academics gear up for the improved implementation of fully articulated undergraduate programmes and a niche suite of postgraduate offerings. With this new trajectory, the Faculty remains committed towards the growth and fit-for-purpose contributions towards the Science, Engineering and Technology (SET) sector.

FEBE has therefore been cognisant of the need to re-brand itself as a key player in engineering and built environment spheres. In addition, FEBE has remained committed to recognising and welcoming the critical role that industry and professional bodies will holistically play towards achieving the intended growth, impact and sustainability of its programmes.

Armed with an array of robust and vigorous 4IR related initiatives, FEBE is eager to embrace and create the road towards a future of unimagined possibilities.

ANNEXURES

A.UJ FACULTY PROFILE 2019

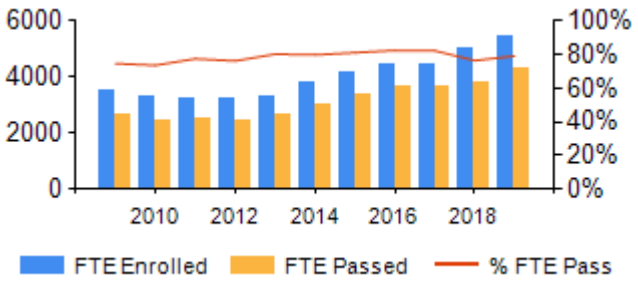
1.

Students:

Overview

	Student Headcount	FTE Enrolled	FTE Passed	FTE % Pass	Graduates
2019	10,179	5,463.1	4,329.9	79.26%	2,890
2018	9,835	5,019.8	3,844.4	76.58%	2,799
2017	9,398	4,443.0	3,661.5	82.41%	2,406
2016	9,604	4,468.9	3,693.7	82.65%	2,229
2015	9,109	4,178.6	3,397.2	81.30%	1,900
2014	8,663	3,774.6	3,016.7	79.92%	1,888
2013	7,595	3,298.3	2,652.7	80.43%	1,639
2012	7,409	3,239.9	2,474.0	76.36%	1,348
2011	7,534	3,208.5	2,490.6	77.62%	1,388
2010	7,148	3,333.8	2,458.6	73.75%	1,385
2009	7,725	3,513.9	2,629.6	74.83%	1,376

FTE: Full-Time Equivalent



2. Students: Overview by Campus

	Student Headcount	FTE Enrolled	FTE PASSED	FTE % PASS	GRADUATES
2019	**10,179**	**5,463.1**	**4,329.9**	**79.26%**	**2,890**
APB Auckland Park Bunting	0	49.9	46.5	93.15%	0
APK Auckland Park Kingsway	2,392	1,170.3	809.3	69.16%	360
DFC Doornfontein Campus	7,787	4,243.0	3,474.1	81.88%	2,530
2018	**9,835**	**5,019.8**	**3,844.4**	**76.58%**	**2,799**
APB Auckland Park Bunting	0	46.5	40.9	87.94%	0
APK Auckland Park Kingsway	2,431	1,312.0	840.2	64.04%	380
DFC Doornfontein Campus	7,404	3,661.3	2,963.2	80.93%	2,419
2017	**9,398**	**4,443.0**	**3,661.5**	**82.41%**	**2,406**
APB Auckland Park Bunting	0	42.8	40.3	94.17%	0
APK Auckland Park Kingsway	2,233	1,094.3	851.2	77.79%	326
DFC Doornfontein Campus	7,165	3,305.3	2,769.3	83.78%	2,080
SWC Soweto Campus	0	0.7	0.7	100.00%	0
2016	**9,604**	**4,468.9**	**3,693.7**	**82.65%**	**2,229**
	0	2.7	2.4	90.65%	0
APB Auckland Park Bunting	0	45.5	39.0	85.76%	0
APK Auckland Park Kingsway	2,183	994.8	770.2	77.43%	294
DFC Doornfontein Campus	7,421	3,421.3	2,878.2	84.13%	1,935

SWC Soweto Campus	0	4.7	3.7	80.01%	0
2015	**9,109**	**4,178.6**	**3,397.2**	**81.30%**	**1,900**
APB Auckland Park Bunting	0	38.1	34.9	91.69%	0
APK Auckland Park Kingsway	2,004	949.7	727.4	76.59%	238
DFC Doornfontein Campus	7,105	3,172.5	2,618.2	82.53%	1,662
SWC Soweto Campus	0	18.3	16.7	91.23%	0
2014	**8,663**	**3,774.6**	**3,016.7**	**79.92%**	**1,888**
APB Auckland Park Bunting	4	40.1	29.6	73.96%	4
APK Auckland Park Kingsway	1,815	849.7	609.0	71.67%	213
DFC Doornfontein Campus	6,844	2,863.0	2,359.0	82.40%	1,671
SWC Soweto Campus	0	21.8	19.0	87.25%	0
2013	**7,595**	**3,298.3**	**2,652.7**	**80.43%**	**1,639**
	2	0.0	0.0	0.00%	1
APB Auckland Park Bunting	397	389.6	358.5	92.02%	305
APK Auckland Park Kingsway	1,760	776.8	601.7	77.46%	223
DFC Doornfontein Campus	5,436	2,114.9	1,677.4	79.32%	1,110
SWC Soweto Campus	0	17.0	15.0	88.24%	0
2012	**7,409**	**3,239.9**	**2,474.0**	**76.36%**	**1,348**
	1	0.0	0.0	0.00%	0
APB Auckland Park Bunting	591	441.0	356.8	80.91%	224
APK Auckland Park Kingsway	1,614	700.4	528.1	75.40%	132

DFC Doornfontein Campus	5,203	2,098.5	1,589.1	75.72%	992
2011	**7,534**	**3,208.5**	**2,490.6**	**77.62%**	**1,388**
	1	1.0	1.0	100.00%	0
APB Auckland Park Bunting	725	458.7	356.6	77.76%	187
APK Auckland Park Kingsway	1,684	708.3	551.6	77.88%	204
DFC Doornfontein Campus	5,124	2,040.3	1,581.3	77.50%	997
SWC Soweto Campus	0	0.3	0.0	0.00%	0
2010	**7,148**	**3,333.8**	**2,458.6**	**73.75%**	**1,385**
APB Auckland Park Bunting	882	541.1	421.9	77.97%	205
APK Auckland Park Kingsway	1,372	712.7	515.8	72.37%	149
DFC Doornfontein Campus	4,894	2,079.9	1,520.9	73.12%	1,031
2009	**7,725**	**3,513.9**	**2,629.6**	**74.83%**	**1,376**
APB Auckland Park Bunting	935	538.8	417.5	77.49%	183
APK Auckland Park Kingsway	1,589	731.5	533.8	72.97%	184
DFC Doornfontein Campus	5,200	2,243.5	1,678.2	74.80%	1,009
SWC Soweto Campus	1	0.0	0.0	0.00%	0

FTE: Full-Time Equivalent

3. STUDENTS:

HEADCOUNTS

	STUDENT	ATTENDANCE MODE		ENTRY STATUS				NSFAS
	HEADCOUNT	CONTACT	DISTANCE	F	T	E	N	RECEIVED
2019	10,179	10,179	0	2,027	524	1,396	6,232	3,437
2018	9,835	9,835	0	1,938	478	1,954	5,465	3,045
2017	9,398	9,398	0	1,601	431	964	6,402	2,408
2016	9,604	9,604	0	1,820	515	991	6,278	1,125
2015	9,109	9,109	0	1,895	459	889	5,866	969
2014	8,663	8,663	0	1,829	317	819	5,698	952
2013	7,595	7,595	0	1,260	304	714	5,317	919
2012	7,409	7,409	0	1,538	307	627	4,937	1,188
2011	7,534	7,534	0	1,932	308	564	4,730	1,170
2010	7,148	7,148	0	1,222	295	585	5,046	1,244
2009	7,725	7,725	0	2,059	219	626	4,821	1,449

Entry Status: F - First-Time Entering; T - Transfer; E - Entering; N - Non-Entering.

NSFAS: National Student Financial Aid Scheme

4. STUDENT DEMOGRAPHICS

	STUDENT	FEMALE	GROUP				AGE GROUP			HOME LANGUAGE			
	HEADCOUNT	%	AFRICAN	COLOURED	INDIAN	WHITE	< 21	21-24	24 >	ENGLISH	ISIXHOSA	AFR.	OTHER
2019	10,179	31	9,598	106	191	284	2,130	4,034	4,015	1,394	662	111	8,012
2018	9,835	30	9,197	108	222	308	1,945	4,181	3,709	1,434	604	120	7,677
2017	9,398	30	8,705	110	227	356	1,860	4,278	3,260	1,295	555	143	7,405
2016	9,604	30	8,870	109	222	403	2,050	4,345	3,209	1,354	528	171	7,551
2015	9,109	30	8,320	104	238	447	2,058	4,180	2,871	1,381	500	190	7,038
2014	8,663	31	7,823	110	233	497	1,963	4,142	2,558	1,327	436	216	6,684
2013	7,595	32	6,749	99	226	521	1,601	3,782	2,212	1,315	411	203	5,666
2012	7,409	32	6,584	108	200	517	2,003	3,591	1,815	1,244	398	201	5,566
2011	7,534	33	6,634	104	196	600	2,288	3,386	1,860	1,423	370	233	5,508
2010	7,148	32	6,160	108	205	675	1,987	3,265	1,896	1,694	345	262	4,847
2009	7,725	31	6,638	105	233	749	2,411	3,357	1,957	2,184	337	306	4,898

5. STUDENT: ACADEMIC

	STUDENT HEADCOUNT	FTE ENROLLED	FTE PASSED	FTE % PASS	GRADUATES
2019	**10,179**	**5,463.1**	**4,329.9**	**79.26%**	**2,890**
Baccalaureus techologiae degree	2,119	1,546.2	1,355.6	87.68%	1,486
Bachelor's Degree (360 - NQF level 7)	2,774	1,705.4	1,438.0	84.32%	180

Bachelor's Degree (480 – NQF level 8)	798	361.1	281.7	78.03%	0
Diploma (360)	1,017	522.6	420.0	80.37%	181
Doctor technologiae degree	4	1.5	0.0	0.00%	0
Doctoral Degree	417	286.6	106.0	36.99%	53
General Academic First Bachelor's Degree	0	3.7	2.5	66.26%	0
Magister technologiae degree	483	180.3	78.0	43.27%	79
Masters Degree	694	228.5	138.6	60.65%	120
National diploma	1,206	229.3	191.2	83.36%	575
Professional First Bachelor's Degree (4 years or more)	667	398.1	318.4	79.98%	216
2018	**9,835**	**5,019.8**	**3,844.4**	**76.58%**	**2,799**
Baccalaureus techologiae degree	1,777	1,201.3	1,067.9	88.90%	1,188
Bachelor's Degree (360 - NQF level 7)	1,859	1,016.5	854.8	84.09%	0
Bachelor's Degree (480 – NQF level 8)	582	216.1	164.4	76.07%	0
Diploma (360)	1,006	554.1	451.1	81.42%	214
Doctor technologiae degree	5	2.2	0.0	0.00%	0
Doctoral Degree	405	435.2	74.0	17.00%	40
General Academic First Bachelor's Degree	0	7.6	4.4	57.81%	0
Magister technologiae degree	425	156.8	68.0	43.38%	68

Masters Degree	647	225.4	157.8	69.99%	131
National diploma	2,209	651.3	550.9	84.58%	945
Professional First Bachelor's Degree (4 years or more)	920	553.4	451.0	81.51%	213
2017	**9,398**	**4,443.0**	**3,661.5**	**82.41%**	**2,406**
Baccalaureus techologiae degree	1,605	1,030.7	876.0	84.99%	888
Bachelor's Degree (360 - NQF level 7)	969	460.8	392.0	85.09%	0
Bachelor's Degree (480 – NQF level 8)	290	101.4	79.7	78.55%	0
Diploma (360)	921	541.4	460.9	85.12%	119
Doctor technologiae degree	5	2.2	0.0	0.00%	0
Doctoral Degree	238	126.1	44.0	34.89%	22
General Academic First Bachelor's Degree	0	15.9	11.4	71.70%	0
Magister technologiae degree	207	73.8	49.0	66.41%	50
Masters Degree	529	190.1	129.1	67.92%	91
National diploma	3,436	1,228.3	1,033.1	84.11%	1,023
Professional First Bachelor's Degree (4 years or more)	1,198	672.3	586.3	87.21%	213
2016	**9,604**	**4,468.9**	**3,693.7**	**82.65%**	**2,229**
Baccalaureus techologiae degree	1,598	989.5	837.3	84.62%	883
Diploma (360)	732	446.1	381.4	85.51%	0

Doctor technologiae degree	7	2.7	2.0	75.30%	1
Doctoral Degree	212	109.2	40.0	36.63%	20
General Academic First Bachelor's Degree	0	14.1	8.0	56.84%	0
Magister technologiae degree	229	81.1	45.0	55.51%	46
Masters Degree	485	171.8	119.4	69.47%	98
National diploma	4,845	1,945.8	1,655.4	85.08%	1,005
Professional First Bachelor's Degree (4 years or more)	1,496	708.7	605.1	85.39%	176
2015	**9,109**	**4,178.6**	**3,397.2**	**81.30%**	**1,900**
Baccalaureus techologiae degree	1,359	858.4	724.1	84.36%	703
Diploma (360)	424	223.8	197.7	88.37%	0
Doctor technologiae degree	10	1.7	2.0	120.05%	0
Doctoral Degree	165	86.4	38.0	43.98%	14
General Academic First Bachelor's Degree	0	14.2	8.1	56.96%	0
Magister technologiae degree	230	84.2	21.0	24.93%	20
Masters Degree	463	192.9	120.6	62.50%	48
National diploma	5,082	2,060.8	1,725.0	83.70%	939
Professional First Bachelor's Degree (4 years or more)	1,376	656.1	560.7	85.45%	176
2014	**8,663**	**3,774.6**	**3,016.7**	**79.92%**	**1,888**

Baccalaureus techologiae degree	1,289	761.1	640.3	84.14%	687
Doctor technologiae degree	9	0.8	0.0	0.00%	0
Doctoral Degree	122	63.8	20.0	31.36%	11
General Academic First Bachelor's Degree	0	11.7	4.6	39.42%	0
Magister technologiae degree	190	67.2	27.0	40.21%	27
Master's Degree	249	126.3	52.3	41.45%	11
Masters Degree	143	37.9	34.0	89.74%	47
National diploma	5,360	2,095.9	1,740.4	83.04%	961
Professional First Bachelor's Degree (4 years or more)	1,301	610.1	498.1	81.64%	144
2013	**7,595**	**3,298.3**	**2,652.7**	**80.43%**	**1,639**
Baccalaureus techologiae degree	1,086	614.6	510.5	83.07%	560
Doctor technologiae degree	6	2.4	0.0	0.00%	0
Doctoral Degree	105	50.5	28.0	55.44%	14
General Academic First Bachelor's Degree	0	18.4	8.3	45.12%	0
Magister technologiae degree	135	47.5	24.0	50.55%	24
Master's Degree	121	54.8	36.9	67.39%	0
Masters Degree	227	71.6	39.5	55.20%	45
National diploma	4,608	1,857.0	1,516.4	81.66%	832

Professional First Bachelor's Degree (4 years or more)	1,307	581.6	489.0	84.08%	164
2012	**7,409**	**3,239.9**	**2,474.0**	**76.36%**	**1,348**
Baccalaureus techologiae degree	1,012	578.2	441.5	76.36%	454
Doctor technologiae degree	7	2.4	2.0	84.96%	1
Doctoral Degree	56	39.9	14.0	35.05%	5
General Academic First Bachelor's Degree	0	14.8	9.5	64.38%	0
Magister technologiae degree	126	41.3	15.0	36.29%	15
Masters Degree	110	76.9	46.2	60.09%	15
National diploma	4,649	1,917.6	1,487.4	77.56%	746
Professional First Bachelor's Degree (4 years or more)	1,449	568.7	458.3	80.59%	112
2011	**7,534**	**3,208.5**	**2,490.6**	**77.62%**	**1,388**
Baccalaureus techologiae degree	1,042	571.6	446.6	78.12%	471
Doctor technologiae degree	7	1.0	0.0	0.00%	0
Doctoral Degree	37	27.5	10.0	36.41%	3
General Academic First Bachelor's Degree	0	15.7	11.2	71.52%	0
Magister technologiae degree	106	39.2	12.0	30.59%	12
Masters Degree	97	67.0	51.9	77.46%	24
National diploma	4,695	1,888.4	1,480.4	78.39%	701

Professional First Bachelor's Degree (4 years or more)	1,550	598.2	478.5	80.00%	177
2010	**7,148**	**3,333.8**	**2,458.6**	**73.75%**	**1,385**
Baccalaureus techologiae degree	1,154	580.7	432.5	74.48%	486
Doctor technologiae degree	6	1.9	0.0	0.00%	0
Doctoral Degree	38	21.9	12.0	54.72%	5
General Academic First Bachelor's Degree	0	19.6	9.3	47.37%	0
Magister technologiae degree	76	39.7	5.0	12.59%	6
Masters Degree	85	53.5	26.0	48.59%	7
National diploma	4,540	1,998.7	1,505.3	75.32%	744
Professional First Bachelor's Degree (4 years or more)	1,249	617.7	468.5	75.85%	137
2009	**7,725**	**3,513.9**	**2,629.6**	**74.83%**	**1,376**
Baccalaureus techologiae degree	1,231	651.0	482.8	74.16%	415
Doctor technologiae degree	5	1.7	0.0	0.00%	0
Doctoral Degree	32	19.4	18.0	92.88%	5
General Academic First Bachelor's Degree	0	22.5	10.5	46.61%	0
Magister technologiae degree	56	25.6	11.0	42.95%	11
Masters Degree	72	37.2	22.0	58.99%	11
National diploma	4,851	2,104.0	1,603.0	76.19%	771

Professional First Bachelor's Degree (4 years or more)	1,478	652.4	482.4	73.94%	163

FTE: Full-Time Equivalent

6. STUDENT THROUGHPUT

	YEAR 1 COHORT	GRADUATES MIN TIME	GRADUATES MIN TIME + 1	GRADUATES MIN TIME + 2	GRADUATES MIN TIME > 2	% GRADUATES
2019						
Baccalaureus techologiae degree	21	11	0	0	0	52.38%
Bachelor's Degree (360 - NQF level 7)	1,020	0	0	0	0	0.00%
Bachelor's Degree (480 – NQF level 8)	308	0	0	0	0	0.00%
Diploma (360)	315	0	0	0	0	0.00%
Doctoral Degree	11	0	0	0	0	0.00%
Magister technologiae degree	170	0	0	0	0	0.00%
Masters Degree	182	4	0	0	0	2.20%
Occasional student	4	0	0	0	0	0.00%
2018						
Baccalaureus techologiae degree	1	1	0	0	0	100.00%

Bachelor's Degree (360 - NQF level 7)	943	0	0	0	0	0.00%
Bachelor's Degree (480 – NQF level 8)	313	0	0	0	0	0.00%
Diploma (360)	294	0	0	0	0	0.00%
Doctoral Degree	8	0	0	0	0	0.00%
Magister technologiae degree	174	2	25	0	0	15.52%
Masters Degree	205	1	19	0	0	9.76%
Occasional student	6	0	0	0	0	0.00%
2017						
Baccalaureus techologiae degree	1	0	1	0	0	100.00%
Bachelor's Degree (360 - NQF level 7)	877	154	0	0	0	17.56%
Bachelor's Degree (480 – NQF level 8)	264	0	0	0	0	0.00%
Diploma (360)	276	64	0	0	0	23.19%
Magister technologiae degree	57	1	6	10	0	29.82%
Masters Degree	125	1	21	19	0	32.80%
National diploma	1	0	0	0	0	0.00%
Occasional student	2	0	0	0	0	0.00%
2016						

Baccalaureus techologiae degree	1	0	0	0	0	0.00%
Diploma (360)	359	115	72	0	0	52.09%
Magister technologiae degree	60	3	6	13	7	48.33%
Masters Degree	116	1	15	29	9	46.55%
National diploma	943	264	160	0	0	44.96%
Occasional student	8	0	0	0	0	0.00%
Professional First Bachelor's Degree (4 years or more)	341	45	0	0	0	13.20%
2015						
Diploma (360)	384	110	80	32	0	57.81%
Magister technologiae degree	84	1	8	18	11	45.24%
Masters Degree	127	0	9	28	21	45.67%
National diploma	989	254	217	60	0	53.69%
Occasional student	2	0	0	0	0	0.00%
Professional First Bachelor's Degree (4 years or more)	311	50	49	0	0	31.83%
2014						
Baccalaureus techologiae degree	1	1	0	0	0	100.00%
Doctoral Degree	1	0	0	0	0	0.00%
Magister technologiae degree	74	2	5	24	14	60.81%

Masters Degree	117	2	13	27	24	56.41%
National diploma	1,360	346	292	133	25	58.53%
Occasional student	2	0	0	0	0	0.00%
Professional First Bachelor's Degree (4 years or more)	276	16	35	37	0	31.88%
2013						
Baccalaureus techologiae degree	5	5	0	0	0	100.00%
Magister technologiae degree	41	0	5	3	7	36.59%
Masters Degree	95	0	6	13	25	46.32%
National diploma	996	237	220	120	49	62.85%
Occasional student	1	0	0	0	0	0.00%
Professional First Bachelor's Degree (4 years or more)	257	14	49	30	14	41.63%
2012						
Baccalaureus techologiae degree	4	1	1	0	0	50.00%
Magister technologiae degree	33	0	4	2	4	30.30%
Masters Degree	73	0	5	16	18	53.42%
National diploma	1,200	187	257	174	100	59.83%
Occasional student	3	0	0	0	0	0.00%

Professional First Bachelor's Degree (4 years or more)	419	18	54	38	24	31.98%
2011						
Baccalaureus techologiae degree	2	2	0	0	0	100.00%
Doctoral Degree	1	0	0	0	0	0.00%
Magister technologiae degree	36	0	5	3	3	30.56%
Masters Degree	49	0	2	13	11	53.06%
National diploma	1,425	263	287	196	109	60.00%
Occasional student	1	0	0	0	0	0.00%
Professional First Bachelor's Degree (4 years or more)	594	19	63	52	29	27.44%
2010						
Baccalaureus techologiae degree	12	2	3	0	0	41.67%
Magister technologiae degree	26	0	4	3	4	42.31%
Masters Degree	39	1	5	7	12	64.10%
National diploma	992	201	175	124	53	55.75%
Occasional student	14	0	0	0	0	0.00%
Professional First Bachelor's Degree (4 years or more)	272	23	32	26	23	38.24%
2009						

Baccalaureus techologiae degree	118	19	17	12	5	44.92%
Doctoral Degree	5	0	0	1	1	40.00%
Magister technologiae degree	21	0	1	6	6	61.90%
Masters Degree	64	0	7	15	15	57.81%
National diploma	1,515	190	262	178	122	49.64%
Occasional student	16	0	0	0	0	0.00%
Professional First Bachelor's Degree (4 years or more)	490	14	39	33	27	23.06%

Year 1 Cohort: Includes only First-Time Entering students for Undergraduate qualifications; but all newly enrolling students for Postgraduate qualifications.

Graduates: Only graduates in the initial qualification are shown; students who may have graduated in another qualification are excluded.

7. STUDENT SUCCESS BY GROUP AND GENDER cont..

	FTE PASS														
	MALE					FEMALE					TOTAL				
	A %	C %	I %	W %	T %	A %	C %	I %	W %	T %	A %	C %	I %	W %	T %
2019	**77%**	**74%**	**78%**	**72%**	**77%**	**85%**	**96%**	**92%**	**64%**	**84%**	**79%**	**80%**	**81%**	**71%**	**79%**
Baccalaureus techologiae degree	86%	65%	98%	86%	86%	92%	87%	95%	100%	92%	88%	75%	97%	87%	88%
Bachelor's Degree (360 - NQF level 7)	82%	87%	87%	91%	83%	88%	89%	93%	86%	88%	84%	88%	88%	89%	84%

Bachelor's Degree (480 – NQF level 8)	76%	89%	88%	89%	77%	80%	100%	92%	82%	81%	77%	93%	89%	88%	78%
Diploma (360)	74%	64%	83%	100%	75%	87%	76%	89%	53%	87%	80%	67%	85%	78%	80%
Doctor technologiae degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Doctoral Degree	40%	0%	23%	37%	39%	29%	0%	250%	0%	31%	37%	0%	43%	33%	37%
General Academic First Bachelor's Degree	69%	50%	0%	0%	63%	100%	100%	0%	0%	100%	70%	64%	0%	0%	66%
Magister technologiae degree	33%	35%	242%	0%	33%	54%	472%	0%	0%	57%	42%	114%	85%	0%	43%
Masters Degree	61%	69%	37%	45%	58%	71%	33%	44%	0%	67%	63%	55%	38%	40%	61%
National diploma	81%	65%	100%	83%	81%	88%	0%	0%	0%	88%	83%	65%	100%	83%	83%
Professional First Bachelor's Degree (4 years or more)	77%	90%	90%	87%	78%	86%	85%	98%	70%	86%	79%	89%	91%	86%	80%
2018	**74%**	**74%**	**84%**	**82%**	**74%**	**82%**	**75%**	**85%**	**81%**	**82%**	**76%**	**74%**	**84%**	**81%**	**77%**
Baccalaureus techologiae degree	87%	94%	98%	90%	87%	92%	97%	99%	100%	92%	89%	95%	98%	91%	89%
Bachelor's Degree (360 - NQF level 7)	83%	77%	81%	85%	83%	88%	97%	97%	97%	88%	84%	81%	84%	88%	84%
Bachelor's Degree (480 – NQF level 8)	73%	83%	87%	92%	75%	79%	100%	86%	100%	81%	74%	90%	87%	94%	76%
Diploma (360)	78%	74%	71%	87%	78%	85%	92%	97%	95%	85%	81%	83%	78%	89%	81%

Doctor technologiae degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Doctoral Degree	15%	0%	34%	42%	17%	12%	0%	0%	86%	16%	14%	0%	30%	48%	17%
General Academic First Bachelor's Degree	41%	0%	0%	73%	43%	86%	0%	0%	100%	87%	58%	0%	0%	76%	58%
Magister technologiae degree	45%	29%	200%	138%	50%	35%	0%	51%	0%	35%	41%	22%	101%	126%	43%
Masters Degree	65%	107%	123%	102%	71%	69%	0%	67%	23%	67%	66%	100%	112%	91%	70%
National diploma	82%	71%	82%	90%	82%	90%	100%	100%	100%	90%	85%	75%	85%	91%	85%
Professional First Bachelor's Degree (4 years or more)	79%	93%	93%	87%	81%	86%	83%	92%	79%	86%	80%	91%	93%	86%	82%
2017	**81%**	**78%**	**82%**	**84%**	**81%**	**86%**	**85%**	**95%**	**64%**	**86%**	**82%**	**80%**	**85%**	**82%**	**82%**
Baccalaureus techologiae degree	82%	90%	92%	88%	83%	89%	92%	96%	100%	89%	85%	91%	93%	88%	85%
Bachelor's Degree (360 - NQF level 7)	84%	63%	63%	85%	83%	90%	100%	50%	96%	90%	86%	71%	62%	89%	85%
Bachelor's Degree (480 – NQF level 8)	77%	0%	78%	92%	78%	78%	100%	90%	94%	80%	77%	100%	82%	92%	79%
Diploma (360)	83%	85%	77%	88%	83%	88%	100%	100%	77%	88%	85%	92%	82%	86%	85%
Doctor technologiae degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Doctoral Degree	37%	0%	69%	35%	38%	14%	0%	112%	0%	19%	34%	0%	79%	26%	35%

General Academic First Bachelor's Degree	71%	100%	55%	40%	69%	76%	100%	100%	100%	81%	72%	100%	80%	52%	72%
Magister technologiae degree	80%	57%	299%	0%	73%	60%	0%	0%	0%	58%	71%	41%	104%	0%	66%
Masters Degree	64%	50%	67%	92%	68%	69%	100%	152%	26%	69%	65%	66%	83%	83%	68%
National diploma	82%	80%	79%	83%	82%	88%	94%	83%	100%	88%	84%	85%	79%	85%	84%
Professional First Bachelor's Degree (4 years or more)	85%	88%	90%	94%	87%	90%	90%	90%	94%	90%	86%	88%	90%	94%	87%
2016	**80%**	**80%**	**85%**	**87%**	**81%**	**87%**	**95%**	**90%**	**80%**	**87%**	**82%**	**83%**	**87%**	**86%**	**83%**
Baccalaureus techologiae degree	81%	78%	83%	89%	82%	90%	100%	0%	94%	90%	85%	81%	83%	90%	85%
Diploma (360)	84%	66%	86%	88%	84%	88%	64%	100%	93%	88%	86%	65%	87%	90%	86%
Doctor technologiae degree	162%	0%	0%	0%	98%	0%	0%	0%	0%	0%	108%	0%	0%	0%	75%
Doctoral Degree	28%	0%	75%	69%	35%	32%	433%	79%	0%	46%	29%	225%	76%	56%	37%
General Academic First Bachelor's Degree	47%	0%	0%	37%	43%	92%	0%	0%	100%	89%	62%	0%	0%	42%	57%
Magister technologiae degree	67%	89%	0%	62%	66%	41%	0%	0%	0%	40%	56%	89%	0%	62%	56%
Masters Degree	66%	36%	96%	98%	72%	54%	0%	113%	75%	60%	63%	36%	100%	96%	69%
National diploma	83%	93%	85%	85%	83%	89%	73%	89%	89%	89%	85%	88%	86%	85%	85%

Professional First Bachelor's Degree (4 years or more)	83%	85%	90%	89%	84%	90%	88%	95%	99%	91%	84%	85%	91%	90%	85%
2015	**79%**	**82%**	**79%**	**84%**	**80%**	**85%**	**79%**	**78%**	**97%**	**85%**	**81%**	**81%**	**79%**	**85%**	**81%**
Baccalaureus techologiae degree	81%	94%	90%	88%	82%	88%	94%	91%	71%	88%	84%	94%	91%	86%	84%
Diploma (360)	89%	76%	72%	24%	88%	89%	88%	100%	100%	89%	89%	80%	73%	65%	88%
Doctor technologiae degree	188%	0%	0%	0%	136%	0%	0%	0%	0%	0%	188%	0%	0%	0%	120%
Doctoral Degree	33%	0%	0%	71%	36%	48%	0%	74%	312%	84%	35%	0%	25%	106%	44%
General Academic First Bachelor's Degree	48%	100%	47%	82%	53%	71%	0%	100%	0%	69%	54%	100%	54%	74%	57%
Magister technologiae degree	21%	56%	62%	51%	25%	26%	0%	0%	0%	25%	23%	56%	54%	33%	25%
Masters Degree	63%	65%	81%	64%	64%	55%	0%	47%	66%	55%	61%	65%	69%	64%	63%
National diploma	82%	90%	80%	85%	82%	88%	92%	75%	90%	88%	84%	90%	79%	86%	84%
Professional First Bachelor's Degree (4 years or more)	84%	80%	91%	91%	85%	87%	61%	98%	89%	87%	84%	77%	93%	91%	85%
2014	**78%**	**71%**	**77%**	**81%**	**78%**	**84%**	**76%**	**85%**	**62%**	**83%**	**80%**	**72%**	**79%**	**79%**	**80%**
Baccalaureus techologiae degree	81%	85%	86%	94%	82%	87%	94%	93%	93%	87%	84%	87%	88%	94%	84%

Doctor technologiae degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Doctoral Degree	30%	0%	40%	34%	31%	67%	0%	0%	0%	33%	35%	0%	28%	27%	31%
General Academic First Bachelor's Degree	20%	0%	33%	65%	29%	75%	0%	0%	100%	77%	35%	0%	33%	68%	39%
Magister technologiae degree	48%	0%	38%	54%	46%	22%	0%	0%	0%	26%	39%	0%	75%	46%	40%
Master's Degree	45%	100%	51%	21%	41%	47%	0%	43%	15%	42%	45%	100%	49%	20%	41%
Masters Degree	81%	0%	92%	118%	92%	62%	0%	79%	155%	76%	77%	0%	91%	120%	90%
National diploma	82%	69%	80%	88%	82%	86%	75%	95%	78%	86%	83%	71%	84%	87%	83%
Professional First Bachelor's Degree (4 years or more)	79%	93%	86%	90%	81%	82%	96%	90%	89%	83%	79%	94%	87%	90%	82%
2013	**78%**	**77%**	**75%**	**84%**	**79%**	**84%**	**81%**	**85%**	**96%**	**85%**	**80%**	**77%**	**77%**	**86%**	**81%**
Baccalaureus techologiae degree	80%	97%	79%	94%	82%	89%	100%	89%	93%	89%	84%	97%	81%	94%	84%
Doctor technologiae degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Doctoral Degree	50%	104%	0%	70%	53%	32%	0%	124%	97%	64%	46%	81%	39%	79%	55%
General Academic First Bachelor's Degree	28%	0%	25%	66%	33%	82%	0%	100%	100%	84%	42%	0%	55%	71%	45%
Magister technologiae degree	44%	0%	95%	57%	47%	46%	0%	115%	138%	60%	44%	0%	101%	81%	51%

Master's Degree	72%	0%	74%	44%	65%	78%	0%	0%	81%	79%	73%	0%	74%	51%	67%
Masters Degree	70%	0%	32%	35%	56%	47%	0%	0%	140%	52%	66%	0%	26%	45%	55%
National diploma	79%	73%	73%	86%	79%	84%	86%	77%	87%	84%	81%	77%	74%	86%	81%
Professional First Bachelor's Degree (4 years or more)	80%	94%	91%	94%	84%	82%	80%	96%	94%	85%	80%	92%	92%	94%	84%
2012	**74%**	**75%**	**75%**	**90%**	**76%**	**81%**	**70%**	**81%**	**79%**	**80%**	**76%**	**74%**	**76%**	**89%**	**77%**
Baccalaureus techologiae degree	74%	87%	78%	88%	75%	86%	100%	96%	92%	86%	78%	90%	82%	88%	79%
Doctor technologiae degree	131%	0%	0%	0%	94%	0%	0%	0%	0%	0%	114%	0%	0%	0%	85%
Doctoral Degree	28%	0%	0%	113%	44%	0%	0%	0%	0%	0%	24%	0%	0%	82%	35%
General Academic First Bachelor's Degree	47%	0%	74%	52%	48%	86%	0%	0%	100%	88%	64%	0%	74%	67%	64%
Magister technologiae degree	33%	0%	45%	95%	42%	20%	0%	0%	75%	24%	29%	0%	33%	90%	36%
Masters Degree	50%	69%	76%	84%	62%	70%	0%	98%	90%	78%	54%	69%	81%	85%	65%
National diploma	76%	76%	67%	87%	76%	81%	69%	87%	85%	81%	78%	74%	72%	86%	78%
Professional First Bachelor's Degree (4 years or more)	76%	83%	87%	93%	81%	78%	82%	84%	88%	80%	76%	82%	87%	92%	81%
2011	**75%**	**77%**	**79%**	**88%**	**77%**	**81%**	**83%**	**68%**	**90%**	**81%**	**77%**	**78%**	**77%**	**88%**	**78%**

Baccalaureus techologiae degree	75%	81%	81%	93%	77%	86%	87%	89%	100%	87%	79%	84%	82%	93%	80%
Doctor technologiae degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Doctoral Degree	17%	0%	0%	99%	37%	0%	0%	0%	74%	33%	15%	0%	0%	91%	36%
General Academic First Bachelor's Degree	58%	0%	0%	79%	62%	82%	0%	50%	100%	83%	70%	0%	24%	85%	72%
Magister technologiae degree	24%	400%	0%	0%	25%	44%	0%	0%	0%	40%	32%	400%	0%	0%	31%
Masters Degree	72%	205%	101%	89%	79%	80%	0%	60%	129%	83%	72%	205%	88%	92%	80%
National diploma	77%	72%	73%	83%	77%	81%	87%	72%	90%	81%	78%	75%	73%	83%	79%
Professional First Bachelor's Degree (4 years or more)	75%	78%	86%	91%	80%	73%	84%	76%	91%	78%	75%	79%	84%	91%	80%
2010	**71%**	**70%**	**75%**	**82%**	**73%**	**78%**	**81%**	**74%**	**87%**	**79%**	**74%**	**72%**	**75%**	**83%**	**74%**
Baccalaureus techologiae degree	73%	73%	84%	90%	74%	81%	88%	100%	92%	82%	75%	77%	86%	91%	77%
Doctor technologiae degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Doctoral Degree	0%	0%	0%	165%	66%	0%	0%	0%	0%	0%	0%	0%	0%	127%	55%
General Academic First Bachelor's Degree	26%	0%	8%	76%	36%	69%	0%	43%	100%	71%	43%	0%	14%	80%	47%

Magister technologiae degree	18%	0%	0%	0%	15%	9%	0%	0%	0%	8%	15%	0%	0%	0%	13%
Masters Degree	59%	76%	100%	39%	55%	53%	0%	89%	132%	88%	59%	76%	97%	50%	59%
National diploma	73%	73%	65%	82%	73%	79%	75%	69%	87%	79%	75%	74%	66%	82%	76%
Professional First Bachelor's Degree (4 years or more)	69%	77%	80%	84%	75%	75%	82%	73%	92%	80%	70%	78%	79%	85%	76%
2009	**73%**	**74%**	**76%**	**83%**	**74%**	**77%**	**81%**	**75%**	**93%**	**77%**	**74%**	**76%**	**76%**	**84%**	**75%**
Baccalaureus techologiae degree	72%	76%	84%	89%	74%	82%	90%	100%	100%	83%	75%	79%	87%	90%	76%
Doctor technologiae degree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Doctoral Degree	32%	0%	0%	130%	84%	0%	0%	0%	186%	145%	32%	0%	0%	141%	93%
General Academic First Bachelor's Degree	33%	100%	36%	51%	39%	56%	0%	57%	92%	67%	39%	56%	40%	65%	47%
Magister technologiae degree	51%	0%	0%	98%	48%	33%	0%	0%	0%	29%	46%	0%	0%	67%	43%
Masters Degree	68%	0%	59%	64%	64%	67%	431%	43%	108%	83%	68%	80%	54%	69%	67%
National diploma	75%	83%	72%	81%	75%	77%	82%	85%	93%	78%	76%	83%	74%	81%	76%
Professional First Bachelor's Degree (4 years or more)	69%	78%	81%	83%	75%	59%	52%	68%	86%	66%	67%	71%	79%	83%	74%

A - African C - Coloured I - Indian W - White T - Total

8. BENCHMARKING

	FTE	FTE	DEGREE CREDIT SUCCESS RATES				
	ENROLLED	PASSED	DEPARTMENT	FACULTY	INSTITUTION	UOT'S	SECTOR
2019	**5,463.1**	**4,329.9**	**79%**	**79%**	**83%**	**0%**	**0%**
020 Arch.Env.	640.0	568.6	89%	89%	88%	0%	0%
03C Oth Vis/Pf	131.5	85.1	65%	65%	84%	0%	0%
040 Bus/Com/Mng	819.2	647.9	79%	79%	81%	0%	0%
080 Eng & E.T.	3,868.4	3,024.8	78%	78%	78%	0%	0%
140 Phys Sc.	1.4	1.0	70%	70%	78%	0%	0%
150 Math Sc.	2.7	2.5	93%	93%	74%	0%	0%
2018	**5,019.8**	**3,844.4**	**77%**	**77%**	**82%**	**81%**	**74%**
020 Arch.Env.	538.8	474.8	88%	88%	88%	85%	84%
03C Oth Vis/Pf	110.3	75.2	68%	68%	86%	88%	85%
040 Bus/Com/Mng	788.6	613.4	78%	78%	81%	79%	68%
080 Eng & E.T.	3,573.0	2,673.5	75%	75%	75%	79%	71%
140 Phys Sc.	6.8	5.5	82%	82%	80%	76%	72%
150 Math Sc.	2.2	2.0	89%	89%	75%	73%	64%
2017	**4,443.0**	**3,661.5**	**82%**	**83%**	**85%**	**81%**	**75%**
020 Arch.Env.	470.2	417.6	89%	89%	90%	85%	84%
040 Bus/Com/Mng	801.9	695.0	87%	87%	84%	78%	68%

080 Eng & E.T.	3,150.4	2,533.0	80%	82%	82%	78%	72%
140 Phys Sc.	17.8	13.5	76%	76%	81%	78%	75%
150 Math Sc.	2.6	2.4	90%	90%	74%	73%	65%
2016	**4,468.9**	**3,693.7**	**83%**	**83%**	**84%**	**83%**	**78%**
020 Arch.Env.	463.8	419.8	91%	91%	90%	87%	85%
040 Bus/Com/Mng	828.5	707.7	85%	85%	83%	81%	71%
080 Eng & E.T.	3,158.9	2,552.5	81%	82%	82%	81%	74%
140 Phys Sc.	17.8	13.8	77%	77%	81%	79%	77%
2015	**4,178.6**	**3,397.2**	**81%**	**81%**	**82%**	**0%**	**0%**
020 Arch.Env.	434.7	386.7	89%	89%	87%	0%	0%
040 Bus/Com/Mng	715.7	606.9	85%	85%	83%	0%	0%
080 Eng & E.T.	3,012.3	2,391.1	79%	80%	80%	0%	0%
140 Phys Sc.	15.9	12.4	78%	78%	81%	0%	0%
2014	**3,774.6**	**3,016.7**	**80%**	**79%**	**81%**	**0%**	**0%**
020 Arch.Env.	423.9	369.4	87%	87%	86%	0%	0%
040 Bus/Com/Mng	580.9	487.1	84%	84%	83%	0%	0%
080 Eng & E.T.	2,758.4	2,150.9	78%	78%	78%	0%	0%
140 Phys Sc.	11.4	9.2	81%	81%	78%	0%	0%
2013	**3,298.3**	**2,652.7**	**80%**	**80%**	**82%**	**74%**	**91%**
020 Arch.Env.	490.1	426.2	87%	87%	85%	74%	77%
040 Bus/Com/Mng	469.6	391.7	83%	83%	82%	71%	89%

080 Eng & E.T.	2,338.5	1,834.7	78%	78%	78%	67%	73%
2012	**3,239.9**	**2,474.0**	**76%**	**76%**	**81%**	**81%**	**77%**
020 Arch.Env.	413.3	343.6	83%	83%	83%	87%	84%
040 Bus/Com/Mng	477.8	372.7	78%	78%	81%	78%	71%
080 Eng & E.T.	2,348.7	1,757.7	75%	75%	75%	80%	73%
2011	**3,208.5**	**2,490.6**	**78%**	**78%**	**79%**	**80%**	**75%**
020 Arch.Env.	449.2	397.6	89%	89%	88%	86%	84%
040 Bus/Com/Mng	473.1	364.5	77%	77%	79%	77%	69%
080 Eng & E.T.	2,286.3	1,728.5	76%	76%	76%	81%	73%
2010	**3,333.8**	**2,458.6**	**74%**	**74%**	**78%**	**79%**	**74%**
020 Arch.Env.	334.2	293.4	88%	88%	84%	85%	83%
040 Bus/Com/Mng	562.0	435.3	77%	77%	78%	74%	67%
080 Eng & E.T.	2,437.6	1,729.9	71%	71%	71%	80%	72%
2009	**3,513.9**	**2,629.6**	**75%**	**75%**	**75%**	**79%**	**73%**
020 Arch.Env.	339.4	274.1	81%	81%	79%	86%	82%
040 Bus/Com/Mng	580.9	451.5	78%	78%	74%	73%	65%
060 Comp. Sc.	84.4	72.5	86%	86%	74%	77%	69%
080 Eng & E.T.	2,463.4	1,791.2	73%	73%	73%	80%	73%
130 Law	17.8	15.0	85%	85%	72%	77%	69%
150 Life/PhysSc	10.4	8.1	78%	78%	71%	76%	74%
220 SocSc/SocSt	17.7	17.2	97%	97%	73%	76%	70%

CESM: Classification of Educational Subject Matter

FTE: Full-Time Equivalent

Degree Credit Success Rate: FTE passes as a percentage of FTE enrolments

UOT's: Universities of Technology

SECTOR: All South African Universities (Including Unisa)

9. RATIOS: STAFF - STUDENT

	PER ACAD STAFF (A)	STUDENT HEADCOUNT (B)	RATIO (B/A)	ACAD STAFF FTE'S (C)	FTE ENROLLED (D)	RATIO (D/C)
2019	189	10,179	1:54	260.60	5,463.14	1:21
2018	186	9,835	1:53	243.92	5,019.77	1:21
2017	188	9,398	1:50	242.25	4,443.00	1:18
2016	180	9,604	1:53	201.11	4,468.95	1:22
2015	159	9,109	1:57	176.39	4,178.58	1:24
2014	155	8,663	1:56	181.16	3,774.60	1:21
2013	137	7,595	1:55	143.68	3,298.27	1:23
2012	134	7,409	1:55	230.51	3,239.92	1:14
2011	100	7,534	1:75	231.32	3,208.52	1:14
2010	98	7,148	1:73	196.21	3,333.76	1:17
2009	93	7,725	1:83	222.37	3,513.88	1:16

FTE: Full-Time Equivalent

Faculty of Engineering and the Built Environment

2019