UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

Reimagining Mechanical Engineering Spaces

Mechanical Engineering students and researchers will flourish with top-notch teaching, learning, study, and collaborative spaces that provide hands-on experiential learning and discovery opportunities.

With a disability-friendly main entrance on Library Road and student collaboration spaces for tinkering, talking, and testing, the redevelopment will breathe fresh life into Mechanical Engineering. Breaking down physical and mental barriers, the changes will enable engineers to push for greater excellence in line with UCT's Vision 2030.

The need

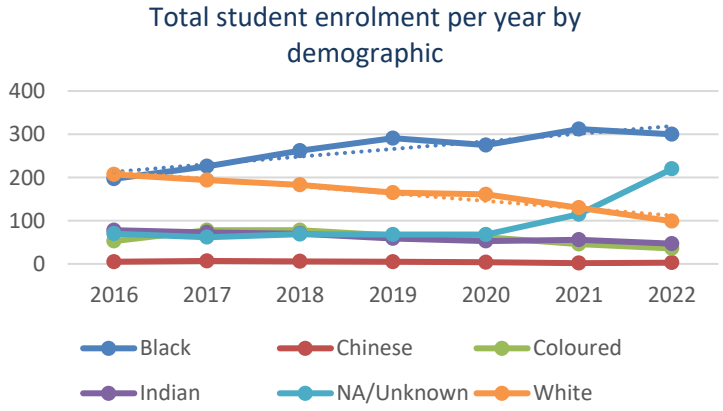
At the heart of UCT's Engineering and Built Environment's (EBE) offering in Mechanical Engineering is its workshop spaces. Developing exceptional talent requires exceptional environments. Talented engineers who work in design, construction, and use of systems of anything that moves – from the human body to machines, to components and intelligence that drives our world.

UCT Mechanical Engineering has reimagined what it means to educate students and do research in the 21st century, ready for the development promise of the 4th Industrial Revolution.

This reimagining enables more actively engaging students via experiential learning, unlocking specialised academic research potential, and innovation at the nexus of undergraduate teaching and research. Spatial renovations are needed to serve these outcomes; workshops & teaching spaces are currently sub-optimal.

Successes

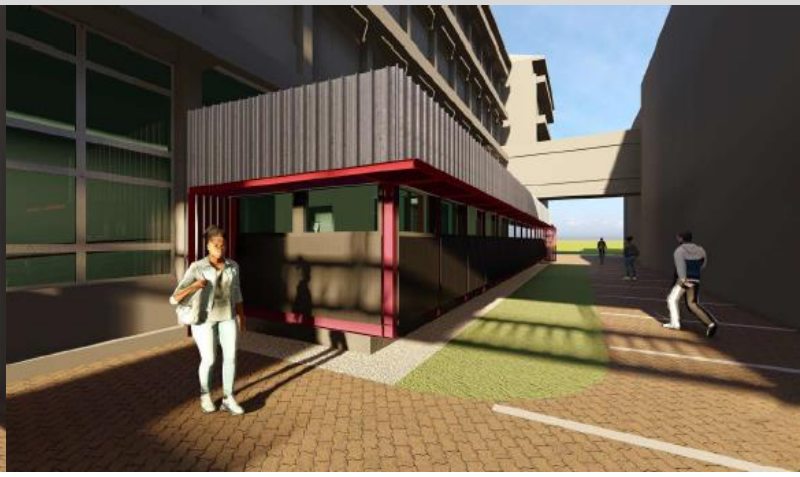
The 2022 QS Rankings shows UCT Mechanical Engineering, maintaining its top-ranked position in South Africa, and second on the continent. Student intake since 2016 is higher than other engineering streams, and growing rapidly. Student diversity is increasing, too, with a significant increase in black SA students studying mechanical engineering at UCT. The Department has averaged 106 mechanical engineer graduates per year since 2016.



Engineers are key to quality of life and human development; the bridge between science and people. Internationally, engineers serving a population is benchmarked at 1:40. SA has a 1:2600 ratio.

WHAT REIMAGINING LOOKS LIKE

Plans are ready for collaborative spaces, high-tech laboratories, and experiential learning facilities, with communal areas for impromptu subject conversations and flexible physical teaching spaces. A glass wall in the Workshop allows light and nature in, allowing curious pedestrians to see the theory-practice link so important in engineering.



Revitalising and renewing Mechanical Engineering is built on excellence

Talent

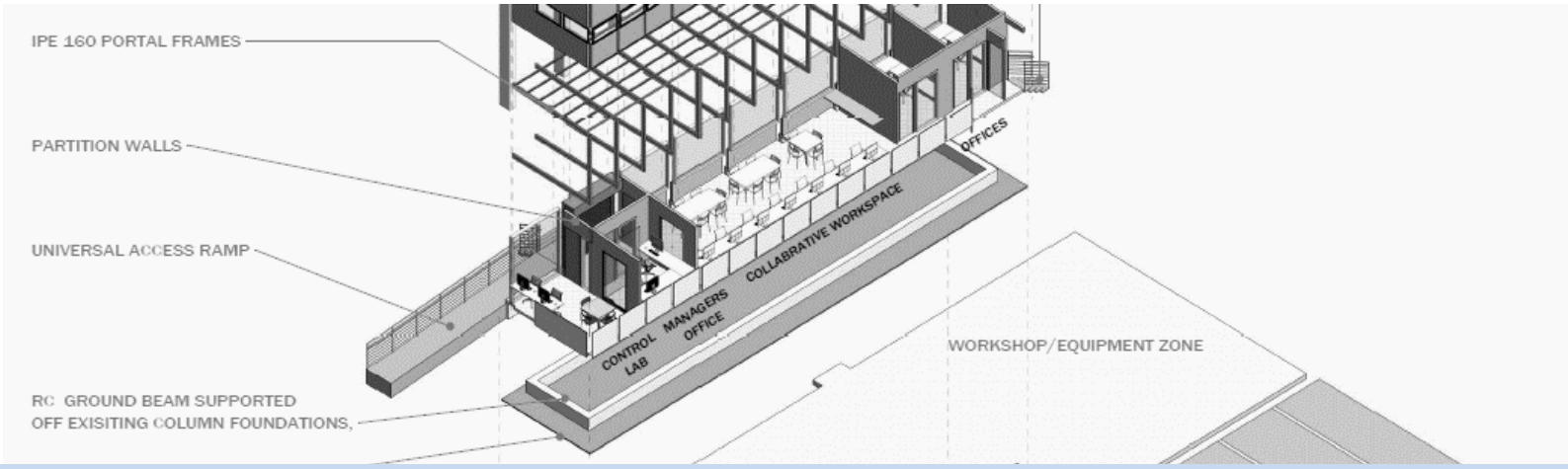
- Active and hands-on student engagement in engineering practice via **the student workshop**, **fabrication facility, and experiential laboratory**
- Creating **modular, flexible, on-demand teaching space**s, enabling increased teamwork to solve complex problems
- **Increasing student understanding** on all elements in the toolbox of being an engineer, engaging with critical artefacts, devices and systems in the discipline

Knowledge

- **Unlocking** research potential currently held back by structural and resource limitations
- Creating **dedicated research and high-tech digital processing spaces for high-profile, leading-edge, first mover research** like mechatronics and computational fluid dynamics
- **Break down the student-academic barrier**; placing them in one space, harnessing academic research ingenuity, curiosity and the magic that comes from solving problems together
- **Reconfigurable research & teaching pods** for project incubation

Innovation

- **Redevelop the Duncan McMillan Workshop** to strengthen the teaching-research nexus
- Develop a world-class lab for a world-class Department, doing away with 'less than optimal'
- Maximise **research knowledge output**; not 'locked in' by current physical and resource limitations
- More space equals specialist equipment enabling a purpose-built lab for maximum **academic knowledge discovery**



UCT Mechanical Engineering produces high-quality outputs with sub-optimal facilities. Imagine what could be unleashed with leading-edge spaces, experiential laboratories, & specialist machines.

REIMAGINING WITH PURPOSE

UCT Mechanical Engineering works with global leaders in business and systems, making for an impressive portfolio of knowledge production and development.

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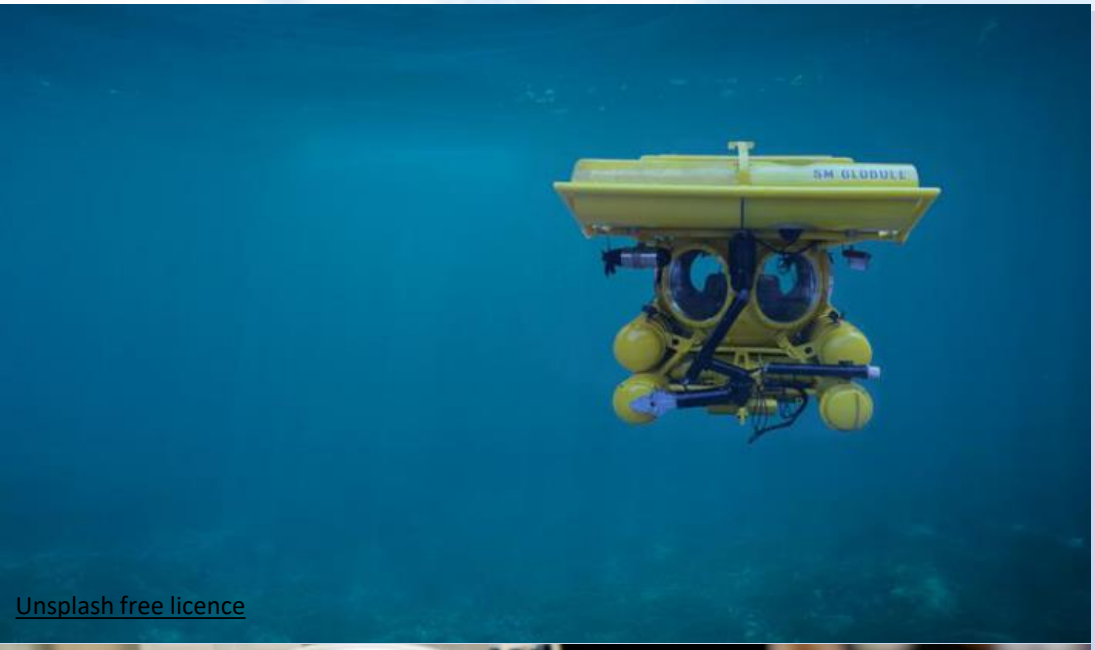
Working with AIRBUS, Mechanical Engineering experts undertake sophisticated computational modelling of fluid flow to improve aircraft safety and performance. The UK Royal Aeronautical Society conferred, in 2020, a silver medal on the Aircraft Fuel Tank Component Design team (an outcome UCT- AIRBUS collaboration) for the application of their research work in computational fluid dynamics.



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UCT Mechanical Engineering marine robotics has vast applications in human search and rescue, research, and conservation. Operated from research or search and rescue vessels, they can go further than human divers, collect samples, expand marine conservation data, and ensure more safety to human lives, on multiple levels.

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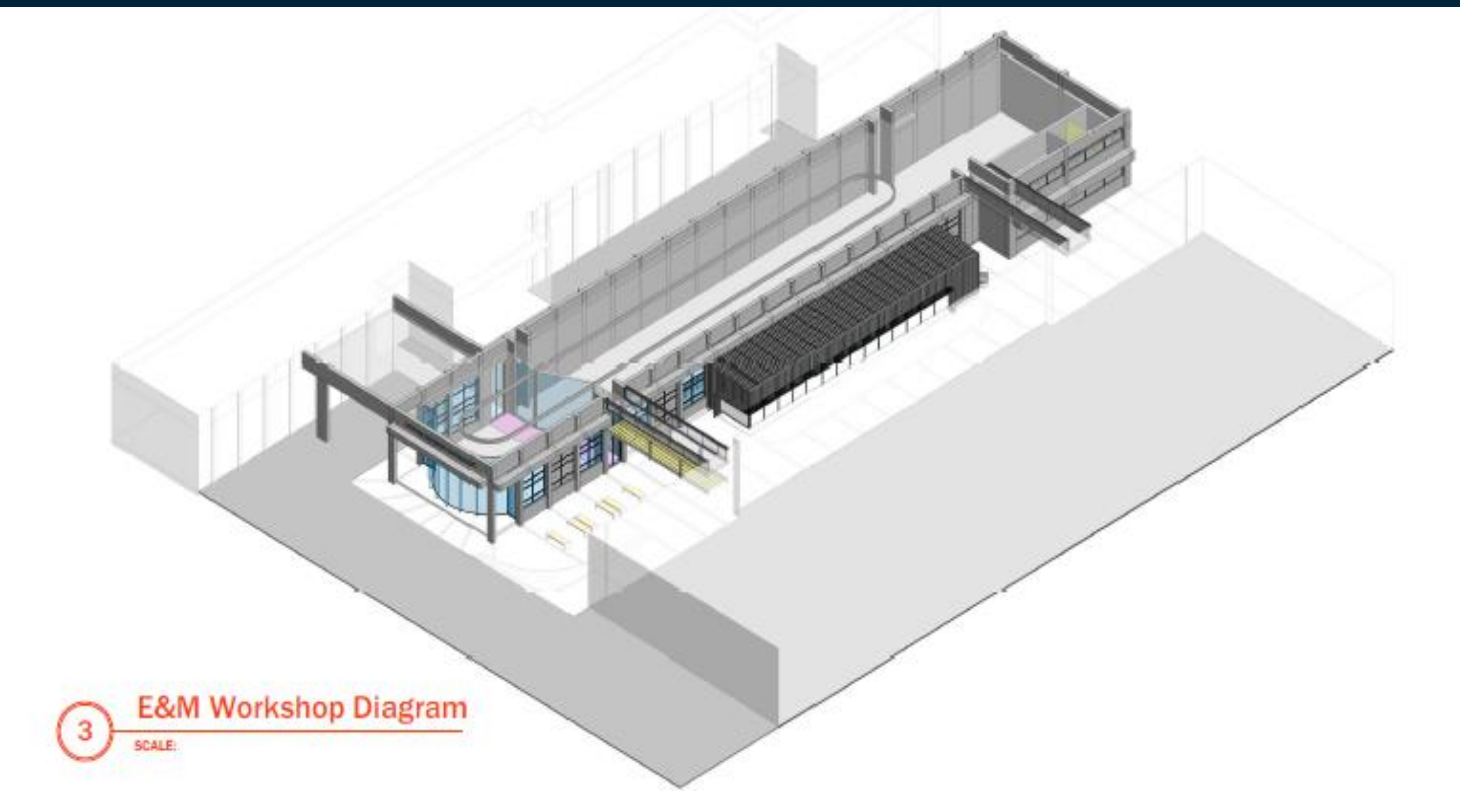
The Robotics and Agents Research Lab (RARL) is an interdisciplinary initiative on Robotics, Artificial Intelligence and Computational Intelligence. Watch the soccer playing Nao robots developed by Mechanical Engineering.

FUNDING REQUEST



UCT seeks co-funding to establish a leading-edge, Duncan McMillan Workshop, redevelopment of Levels 1 and 2 of the Electrical & Mechanical Engineering building, including academic-student collaborative spaces, positioning EBE's Mechanical Engineering to drive its reimagined vision for high quality delivery.

The total cost is R29,4 million.

The University is investing **R14,5m** in the renovation. The EBE Faculty contribution of this amount is **R3m**.

The total funding gap is R14,9m.

The redevelopment will take place in phases.

We invite you to leverage this investment by donating the additional **R6,8m for the Workshop and R8,03m for the 21st century research-teaching-fabrication spatial need.**

Phase 1: Renovating Duncan McMillan Workshop	R14 143 788
EBE contribution	R1 500 000
UCT contribution	R5 762 500
Funding gap	**R6 881 288**

Phase 2: Renovating Student, Teaching and Research Spaces	R15 293 249
EBE contribution	R1 500 000
UCT contribution	R5 762 500
Funding gap	**R8 030 749**

Naming rights, for a contracted period or in-perpetuity, can be negotiated. Significant foot traffic in students, staff, visiting academics, researchers and University partners will pass through and around the renovated spaces. The façade of Library Avenue will be reshaped, updating the feel of being on campus, and recreating the meaning of what it means to be at the best university in Africa.

Contact

Professor Brandon Collier-Reed
Department of Mechanical Engineering
Engineering & Built Environment
brandon.collier-reed@uct.ac.za
+27-21-650 3231

Mr Sidney van Heerden
Deputy Director, Head of Fundraising
Development and Alumni Department
sidney.vanheerden@uct.ac.za
+27-21-650 5458