

FACULTY OF
SCIENCE AND
ENGINEERING



MACQUARIE
University
SYDNEY • AUSTRALIA

Strategic Framework

2022–2026

Introduction

The world is changing at a pace never seen before, driven by social, technological and economic challenges. Within this rapidly shifting landscape, the university sector needs to operate in ways that support both continuous and transformational change, and to do so in a socially and environmentally sustainable way.

The Faculty of Science and Engineering is purpose-driven. We are determined to lead positive change for our students, staff and partners by focusing on social and environmental sustainability in both our education and research. The faculty undertakes a broad range of research activities at the highest national and international levels. It is home to world-class research centres and continues to grow links with industry by building partnerships with commercial, government, cultural and professional organisations.

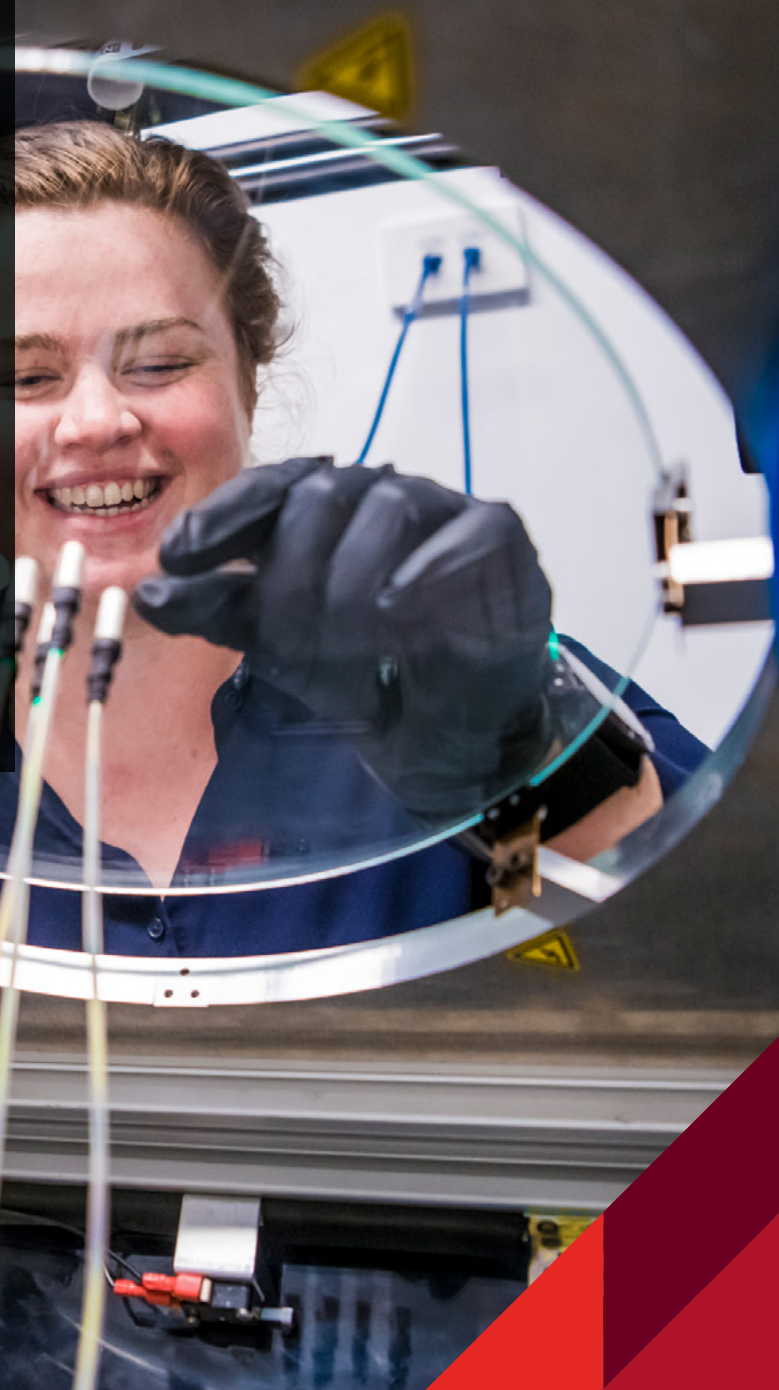
We are taking responsibility for environmental sustainability, now and into the future, by aligning our research and course curricula with the United Nations Sustainable Development Goals, with Indigenous systems and knowledge and with the new economy – driven by renewable energy sources and managed by emerging digital technologies.

We think of education as the great equaliser and a way of underpinning social sustainability. As such, we are working towards personalised education through developing an innovative digital platform in addition to providing meaningful face-to-face learning on campus. Our aim is to give all students, independent of background and previous performance, the best chance of sustained success in their chosen careers.

Macquarie University is establishing itself as a leader in equality and inclusion, and we have been recognised for our progress in shaping a welcoming, diverse and inclusive organisation. We are proud to be recognised as an Employer of Choice for Gender Equality by the Australian Workplace Gender Equality Agency for our progress towards gender equity, and we are focused on long-term systemic change.

Distinguished Professor Lesley Hughes

Interim Executive Dean
Faculty of Science and Engineering





Acknowledgement of country

We acknowledge the Traditional Custodians of the land upon which this University is situated, the Wallumattagal people of the Dharug Nation, whose cultures and customs have nurtured, and continue to nurture, this land since the Dreamtime. We pay our respects to the Dharug people and the Wallumattagal Clan. We also wish to acknowledge and pay our respects to the Elders of the Dharug Nation – past, present and future. We further wish to honour and pay our respects to the ancestors and spirits of this land. We humbly ask that all members of the Macquarie University community are granted the capacity to wingara – to think, to learn and to walk safely upon this pemul (this land). The University continues to develop respectful and reciprocal relationships with First Nations peoples in Australia and with Indigenous people throughout the world.



WHO WE ARE

The Faculty of Science and Engineering undertakes a broad range of research and teaching activities at the highest national and international levels. We offer undergraduate and postgraduate degrees across a diverse range of disciplines.

Our passionate staff and engaged students are dedicated to advancing science and engineering. The faculty has more than 600 staff (academic, professional and technical), 6000 students (equivalent full-time student load) and 400 higher degree research students. In 2022 our annual budget is approximately \$136 million, and we receive \$40 million in Higher Education Research Data Collection (HERDC) research income.

Our collaborative education and research partnerships extend not only across every faculty at Macquarie but also throughout the world. We continue to establish and strengthen links with industry by building partnerships with commercial, government, cultural and professional organisations. For example, Macquarie is now host to the Australian Research Council (ARC) Training Centre for Facilitated Advancement of Australia's Bioactives. The training centre will help Australia make the most of the growing global market for bioactive ingredients and brings together universities in Australia, the United Kingdom, Germany and Brazil, and 14 respected industry partners.



OUR PURPOSE

We believe in education as an equaliser, enabling our students to reach their full potential. We aim to be the best for the world, working with our communities to discover, innovate and build the new economy with environmental and social sustainability at the core.



OUR SCHOOLS

- School of Computing
- School of Engineering
- School of Mathematical and Physical Sciences
- School of Natural Sciences

OUR RESEARCH DEPARTMENTS

- Applied BioSciences
- Australian Astronomical Optics – Macquarie

OUR WORLD-CLASS RESEARCH CENTRES

- ARC Centre of Excellence in Synthetic Biology
- ARC Centre of Excellence for Engineered Quantum Systems
- ARC Centre for Fruit Fly Biosecurity Innovation
- ARC Industrial Transformation Training Centre for Facilitated Advancement of Australia's Bioactives (FAAB)
- Cyber Security Hub



OUR MISSION AND VISION STATEMENT

We believe in the power of STEM to engage minds and change lives.

OUR STRATEGIC GOALS

- Equip our STEM graduates with the fundamental skills, knowledge and ability to adapt to and prepare for their careers.
- Work with our communities and industry, utilising our capacity and capabilities, to innovate for the future.
- Discover and build the new economy with environmental and social sustainability.
- Grow and engage with our current and future partners.

Our shared ambition

Macquarie is a university of service and engagement. We prepare our students for successful futures in a demanding, dynamic and uncertain yet exciting world.

We prepare our graduates to:

- excel in demanding jobs
- face the dynamic world with confidence
- tackle uncertainty with optimism
- seize opportunity to be innovators.

They do this through:

- knowing the power of connection
- experiencing the rigour of deep thinking
- seeing the power of community and collaboration in solving problems
- engaging in a contemporary educational experience.

Our research deepens knowledge and delivers impact for communities small and large, near and far, in a complex and ever-changing world.

Our focus is on:

- deepening understanding and creation of new knowledge
- maximising impact to benefit society
- collaborating with partners to harness the power of connection
- preparing research graduates for productive, diverse and exciting careers.





Our commitment for the future

We aspire to be:

- renowned for graduate employability, putting students and their success first by leveraging our deep industry connections to deliver an outstanding student experience combined with innovative learning and teaching, and a coursework suite design centred on employability
- sustainably ranked in the top 200 and on a trajectory to be among the top 150 universities in the world through a continued focus on multidisciplinary research, investment in defined research areas and training, and an acceleration of growth and diversification in sources of external income
- an employer of choice that recruits, retains and develops the highest-performing academic and professional staff who, through our collaborative and collegial culture, are nurtured to seize opportunities. We have a heightened emphasis on performance, professional development and adaptability to meet the ever-changing requirements of the communities we serve
- known globally for our deep connections between students, academics, industry, society and global partners that defy the traditional boundaries of academia to effect change.



About our strategic framework

The *Faculty of Science and Engineering strategic framework 2022–2026* is aligned with the six areas of focus under the *Macquarie University Operating Plan 2020–2024*. Under each focus area we have developed faculty-specific initiatives that will guide us in achieving the goals for the next five years.

Focus areas for Macquarie University

- Students first.
- Coursework suite and delivery.
- Focused investment in research.
- Our people.
- Ways of working.
- Digital transformation.

Focus areas for the Faculty of Science and Engineering

- Education as an equaliser, partnering with students to realise their full potential.
- Working with our community to discover, innovate and build the new economy, with environmental and social sustainability at its core.
- Creating a great place to work and study that builds confident and courageous people.
- Developing sustainable and transparent processes.

Streams for the Faculty of Science and Engineering

- Improve the student experience, outcomes and employability.
- Improve the curriculum.
- Implement new ways of teaching.
- Improve the quality of courses.
- Develop new courses to allow for career changes.
- Improve industry engagement.
- Ensure higher degree research and pathway programs are fit for purpose.
- Develop five-year research plans for staff.
- Develop research targets and tools for investment decision-making.
- Build a ‘for you’ culture.
- Develop a people plan.
- Implement industry-focused teaching and leadership.
- Deliver appropriate spaces, infrastructure and facilities to attract and retain students and outstanding staff.
- Develop and deliver our international and outreach plans.
- Improve our organisational structure and governance.
- Develop budget transparency and incentives for performance.
- Examine and revise key processes for transparency and efficiency.

This strategic framework is underpinned by a detailed implementation plan setting our actions and milestones.

1. Students first

Faculty focus: enabling all students to realise their full potential

FACULTY STREAM	NO.	INITIATIVE
Improve the student experience, outcomes and employability.	1.1	Develop targeted strategies to support students at risk, with a focus on commencing students and students from lower socioeconomic backgrounds.
	1.2	Provide timely and relevant feedback and action to students through the Student Experience team, and undertake a pedagogy review to understand when and how feedback is given in each unit.
	1.3	Expand work-integrated learning for postgraduate students.
	1.4	Introduce STEM and women in STEM undergraduate scholarships.



2. Coursework suite and delivery

Faculty focus: education as an equaliser, partnering with students to realise their full potential

FACULTY STREAM	NO.	INITIATIVE
Improve the curriculum.	2.1	<ul style="list-style-type: none"> Shift to course-based design for meaningful on-campus learning events that focus on problem-solving and connection. Embed the United Nations Sustainable Development Goals, employability skills, quantitative/data-driven science skills and Indigenous knowledge in courses. <p><i>Note: This initiative is to be enabled through curriculum reviews and changes for all our degrees, commencing with the Bachelor of Engineering, the Bachelor of Information Technology and the Bachelor of Science.</i></p>
Implement new ways of teaching.	2.2	<p>Undertake pedagogy reviews and changes, including:</p> <ul style="list-style-type: none"> performing a cost-benefit analysis of new tools and innovations introducing flexible learning measures to increase engagement considering long-term agreements with technology and textbook partners adopting personalised education. <p><i>Note: This initiative will equip our STEM graduates with the fundamental skills, knowledge and ability to adapt to and prepare for the next 40–50 years of work.</i></p>
Improve the quality of courses.	2.3	<p>Enable a modern curriculum and pedagogy through staff development and training by:</p> <ul style="list-style-type: none"> providing effective and efficient assessment undertaking reflective assessment of feedback improved communication with students developing consistent iLearn pages providing consistent and regular feedback for staff ensuring consistent and regular communication between schools and student liaison committees.
Develop new courses to allow for career changes.	2.4	Revise postgraduate entry criteria, where possible, to allow for future career change pathways.
	2.5	Regular review of the job market and develop new online offerings to meet requirements for careers of the future.
	2.6	Develop new offerings in computing: Bachelor of Information Technology – Majors in Networking and Artificial Intelligence, and Master of Information Technology – Majors in the Internet of Things and Artificial Intelligence.
	2.7	<p>Use an investment decision-making matrix to enable us to test proposed courses and products for:</p> <ul style="list-style-type: none"> growth potential strategic alignment our existing and potential capability (staff and specific area of research strength) teaching and research nexus. <p><i>Note: This initiative is to be considered in line with providing time for academic staff to significantly redevelop existing courses or create new courses</i></p>

3. Focused investment in research

Faculty focus: working with our community to discover, innovate and build the new economy, with environmental and social sustainability at its core

FACULTY STREAM	NO.	INITIATIVE
Improve industry engagement.	3.1	Sharpen strategy to understand and collaborate with industry to develop new ideas or solutions to challenges through: <ul style="list-style-type: none"> • hosting an ‘ask and assist’ program – that is, a series of events connecting industry with researchers to solve problems for mutual benefit • training, mentoring and coaching programs for staff and higher degree research students on how to diversify activity and funding to build capacity and a five-year planning horizon for staff and candidature for higher degree research students • promoting and providing opportunities for staff to undertake external training and engagement opportunities with leading organisations in science, technology and engineering.
Ensure higher degree research and pathway programs are fit for purpose.	3.2	Work with Macquarie’s Graduate Research Academy to ensure the Bachelor of Philosophy, the Master of Research, the Master of Philosophy and PhD offerings are fit for purpose and: <ul style="list-style-type: none"> • are aligned with ‘Focused Investment in Research’ (FOCI) under the Macquarie University Operating Plan 2020–2024 • maximise employability for graduates (through internships and industry-based PhDs for which we wish to offer co-funding).
Develop five-year research plans for staff.	3.3	Embed five-year individual academic research career and funding plans in the annual development and performance review process that: <ul style="list-style-type: none"> • consider the faculty and university research priorities • link to training, mentoring and coaching.
Develop research targets and tools for investment decision-making.	3.4	Set targets and strategies to diversify research funding and innovation activity. <i>Note: This initiative will lead to realistic and stretch goals and commercial income targets for the faculty as a whole.</i>
	3.5	Sharpen focus and investment in research strengths, and ensure our areas of potential are also aligned with our curriculum.
	3.6	Focused investment in research using an investment decision-making matrix to ensure support for: <ul style="list-style-type: none"> • growth • strategic alignment with the faculty and university strategic plans • existing and potential capability (staff and specific area of research strength) • teaching and research nexus.

4. Our people

Faculty focus: creating a great place to work and study that builds confident and courageous people

FACULTY STREAM	NO.	INITIATIVE
Build a ‘for you’ culture.	4.1	Build a “for you” culture by engaging external experts, bringing together the new academic and professional staff structure, creating a great place to work.
Develop a people plan.	4.2	Develop a plan that includes: <ul style="list-style-type: none">• understanding our current culture and strategy to build a balanced academic workforce across job families for the teaching and research needs of the faculty• a diversity and inclusion plan for the faculty and its schools and departments• a workforce plan for effective succession planning and for the attraction and retention of staff
Implement industry-focused teaching and leadership.	4.3	Expand and support teaching and leadership job families through: <ul style="list-style-type: none">• investing in new staff• creating a community of practice.
	4.4	Define and implement an industry and technical job family including recruiting new staff and/or transitioning staff into these roles, where appropriate.
Deliver appropriate spaces, infrastructure and facilities to attract and retain students and outstanding staff.	4.5	Develop a business plan in consultation with Property Services for appropriate space and facilities for the relocation to the main campus of the School of Engineering and the Australian Astronomical Optics – Macquarie.
	4.6	Develop a long-term (5–10 years) infrastructure and facilities management plan that considers the assets and infrastructure needed to attract and retain students and outstanding staff.

5. Ways of working

Faculty focus: being the best for the world

FACULTY STREAM	NO.	INITIATIVE
Develop and deliver our international and outreach plans.	5.1	Develop an outreach plan in consultation with Group Marketing, Macquarie International, Future Students and the Deputy Vice-Chancellor (Research) portfolios. <i>Note: This initiative will include a marketing, recruitment and admissions review to inform the plan and consider strategic goals alongside recruitment into courses. The outreach plan will also ensure we have in place an active program of visiting speakers and internal and community events.</i>
	5.2	Implement the Global Partners Engagement Framework: <ul style="list-style-type: none">• develop and execute the FSE International Engagement Plan.
Improve our organisational structure and governance.	5.3	Review our governance structure and implement recommendations, including the formation of new schools and a faculty executive committee. <i>Note: This initiative also relates to ‘Our people’ focus area.</i>
	5.4	Ensure the faculty’s departments, schools and large units have: <ul style="list-style-type: none">• an active advisory committee in place with appropriate industry and student representation• a strategic and operational plan in place that is reviewed regularly.

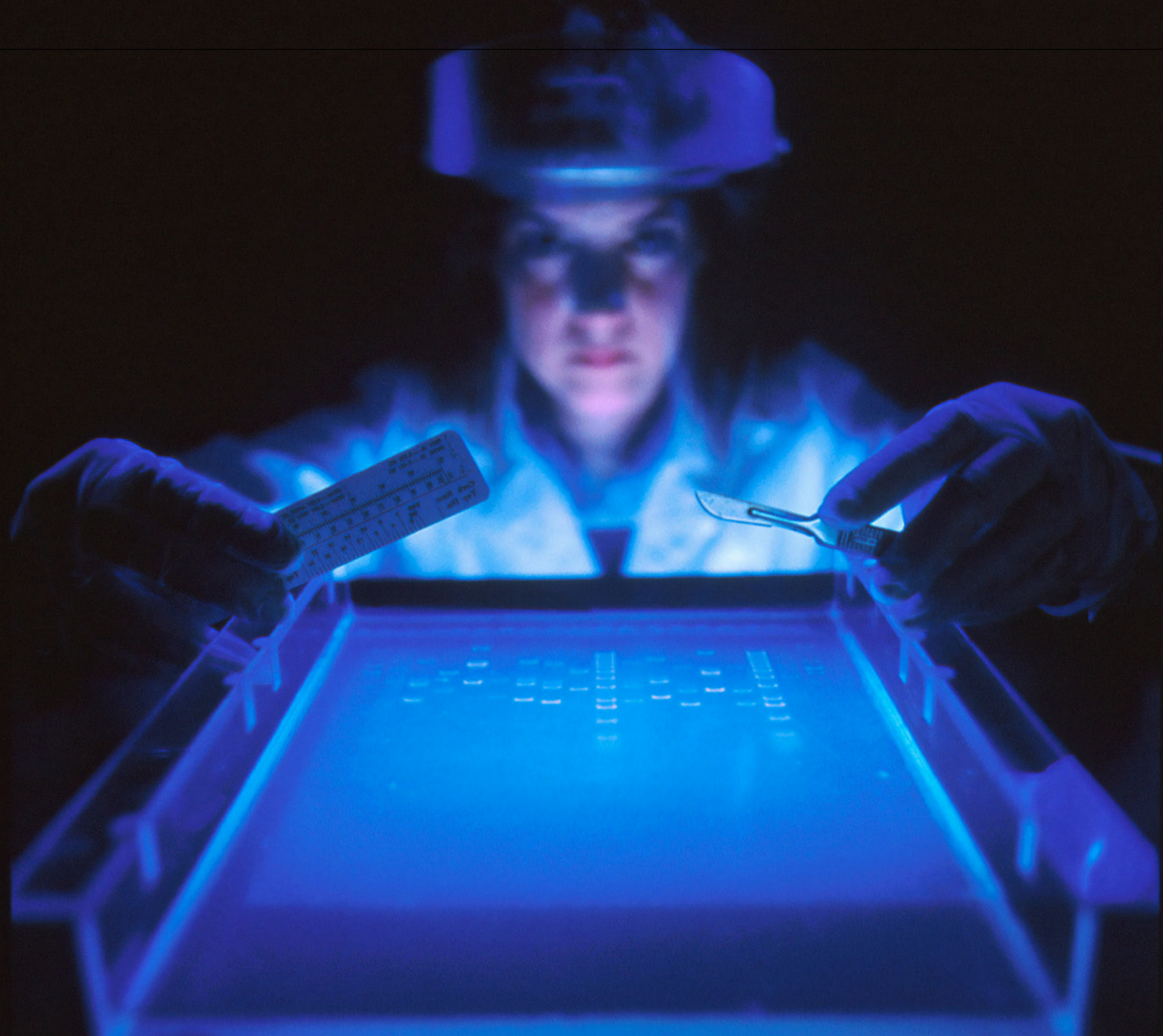
6. Digital transformation

Faculty focus: developing sustainable and transparent processes

FACULTY STREAM	NO.	INITIATIVE
Develop budget transparency and incentives for performance.	6.1	Develop budget transparency and incentives to enhance and support the performance of departments and schools.
	6.2	Engage with Finance to implement an investment decision-making matrix to maintain areas of strength, build emerging areas and take up opportunities in a disciplined manner.
Examine and revise key processes for transparency and efficiency.	6.3	Examine and revise key processes with the aim of transparency and efficiency for more streamlined administration procedures and role clarity. Key processes include timetabling and class registration course advice, examination timetabling and a study plan tool.
	6.4	Establish a technical system to book, track and report on access to laboratories, including functionality that determines the training required for initial and sustained access for staff and students to different laboratories.

Timeline

FOCUS AREA	FACULTY STREAM OR INITIATIVE	TIMELINE
Students first	Provide timely and relevant feedback and action to students through the Student Experience team, and undertake a pedagogy review to understand when and how feedback is given in each unit.	November 2022
	Introduce STEM and women in STEM undergraduate scholarships.	December 2022
	Expand work-integrated learning for postgraduate students.	June 2023
Coursework suite and delivery	Implement new ways of teaching, and complete pedagogy reviews and changes.	December 2023
	Improve the quality of courses through new teaching innovation.	December 2023
Focused investment in research	Develop five-year research career and funding plans, and embed in the annual performance development review process.	December 2023
Our people	Build a 'for you' culture, and develop a people plan.	December 2023
Ways of working	Improve our organisational structure and governance.	December 2024
Our people	Implement industry-focused teaching and leadership.	December 2024
Digital transformation	Develop budget transparency and incentives for performance.	December 2024
Focused investment in research	Ensure higher degree research and pathway programs are fit for purpose.	December 2024
Student first	Develop targeted strategies to support students at risk, with a focus on commencing students and students from low-socioeconomic backgrounds.	December 2026
Coursework suite and delivery	Develop new courses to allow for career changes.	December 2026
Focused investment in research	Develop research targets and tools for investment decision-making.	December 2026
Focused investment in research	Improve industry engagement.	December 2026
Our people	Develop a long-term facilities plan that considers the assets and infrastructure needed.	December 2026
Ways of working	Develop and deliver an outreach plan and an international plan.	December 2026
Digital transformation	Examine and revise key processes for transparency and efficiency.	December 2026



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FIND OUT MORE

Office of the Executive Dean
Faculty of Science and Engineering
Macquarie University
NSW 2109 Australia

T: +61 (2) 9850 9101

E: fse.execdean@mq.edu.au

mq.edu.au

