WEM 2024 INDUSTRY GUIDE
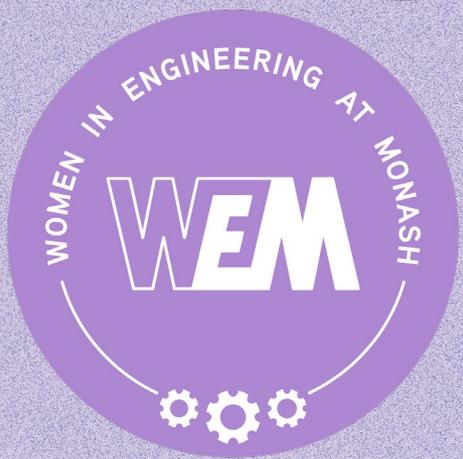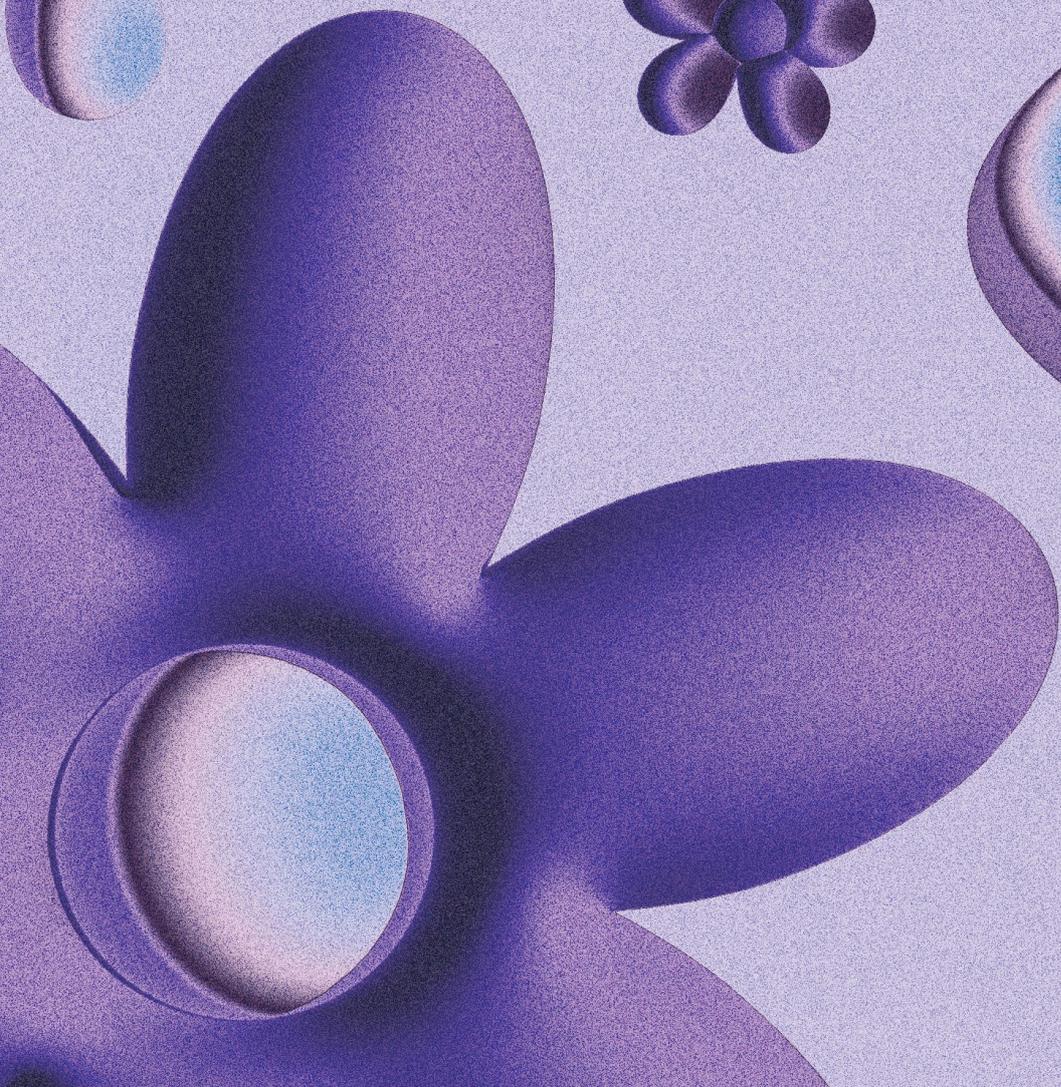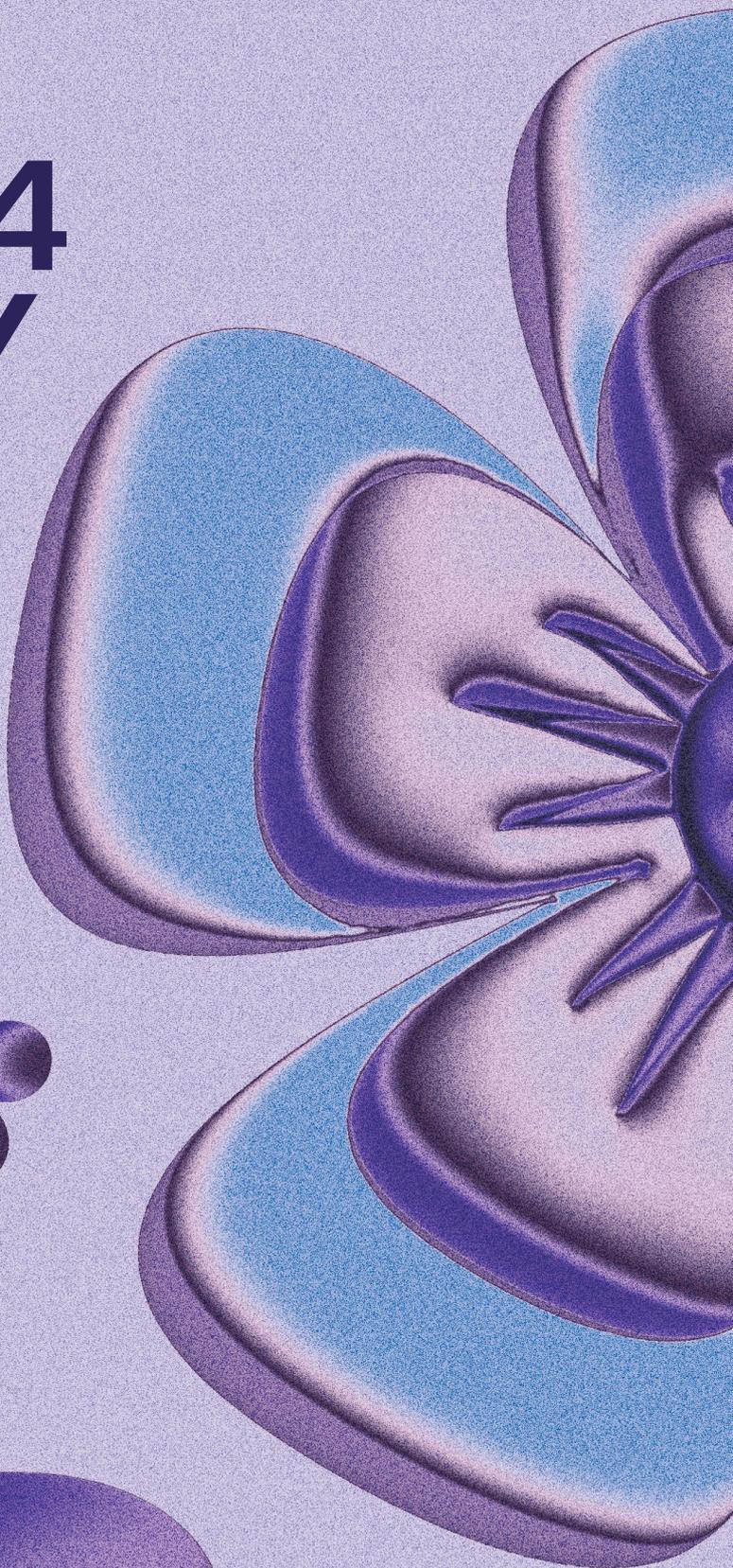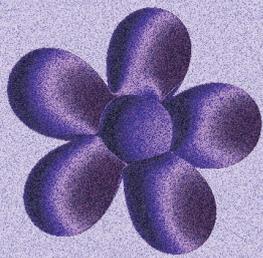
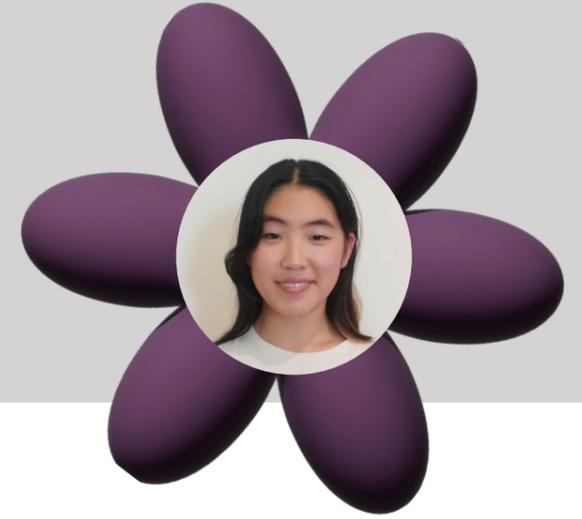WOMEN IN ENGINEERING AT MONASH

WEM

Introduction: Welcome to the WEM Industry Guide!

By Claire Zhang

Who are we?

Women in Engineering at Monash (WEM) is a student-run club committed to supporting women-identifying students in STEM by providing social, academic, industry and outreach events within schools, Monash University, the industry and beyond.

What is the Industry Guide?

The WEM Industry Guide aims to inspire and educate aspiring women engineering students with insightful interviews, thought-provoking articles, and by highlighting industry opportunities. This year's guide embraces a floral theme, symbolising how women are continually growing in the industry. For WEM, flora represents our members and the diversity we champion—each student advancing at their own pace, across various specialisations, ready to blossom into the industry and tackle real-world challenges.

The guide provides a comprehensive section detailing our sponsor companies' core values, projects and dedication to diversity, showcasing the wealth of opportunities available.

What follows is a journey through the university experience, covering common student concerns such as internships, transitioning through each year and joining clubs and/or teams. With guidance from lecturers, award-winning peers and penultimate or final year students, we encourage you to embrace a vibrant and experimental university journey.

We also delve into the industry landscape, with insights from recent graduates and experienced women engineers. With topics ranging from technological advancements to research to startups, learn about what the industry has to offer.

Thank you to the WEM committee for your enormous contribution to this publication through writing and proofreading each piece, while fostering a collaborative and supportive spirit. Special shout-out to the Industry Team for planning, organising and executing both the guide and the launch event with the utmost diligence and enthusiasm.

Thank you to our sponsors, for providing the support that enables our community to continue to grow, and for sharing countless opportunities.

A special thank you to our talented guide designer, Lucy, whose dedication and attention to detail ensured the guide surpassed all expectations. Her artwork beautifully complements and enhances the articles and interviews presented in the Industry Guide.

Finally, to our members—thank you. Your support made this guide possible to create. We hope it empowers you to plant yourself firm in your passion, and bloom wherever your journey leads.
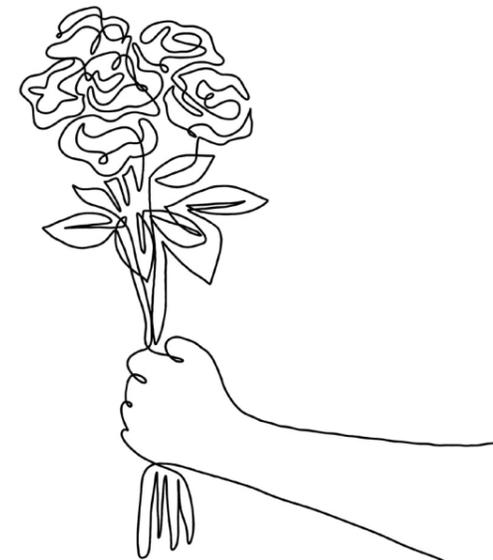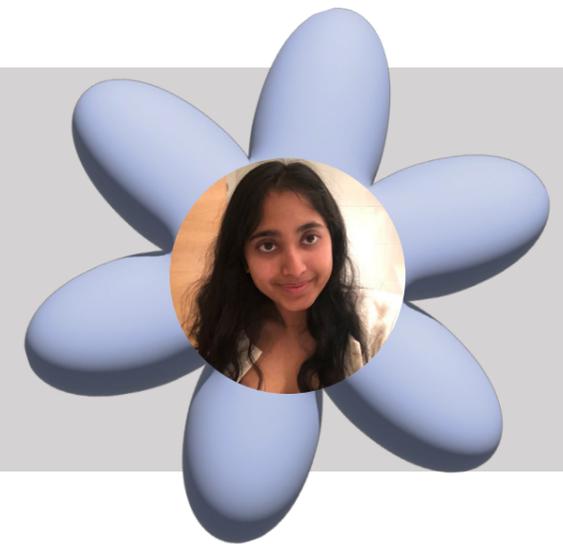
— Claire Zhang, *Industry Director*

Table of Contents

President's Address

By Ashali Haputhanthri

"Never let anybody tell you you can't do it. I had someone tell me most people change their minds after the first year. I never gave up," was what Michelle Haupt said, the operations engineer at NASA. This culture of perseverance is what Women in Engineering at Monash (WEM) strives for. We are dedicated to creating and fostering support networks among women — identifying engineering and STEM students, so that we keep shining through our passions without other voices telling us otherwise.

WEM has been thriving, we pursue excellence and grow day by day. As our club gains recognition for what we stand for, especially with the name change from Female Engineers at Monash (FEM) to WEM, we have seen the massive improvement of inclusion, diversity and acceptance amongst engineering and STEM students, staff and sponsors. Our efforts have been acknowledged by Monash Clubs & Societies, Monash Student Association (MSA) and TeamMonash at the Monash Awards 2024, where WEM received the 'Most Outstanding Publication — Careers Guide' and the 'Most Popular Club — Category C' awards at the prestigious event. This incredible achievement is recognised through the committee's, sponsors' and members' hard work, perseverance and strength.

"All sorts of things can happen when you're open to new ideas and playing around with things," was what an inspirational woman in STEM, Stephanie Kwolek once said. On top of WEM hosting our traditional events, we also have a roster of new events this year such as the collaboration cocktail night with SMUCE, MEES, SMEE, TEM and CREE, a Pancake BBQ and collaborating with Monash Engineering Girls (MEG) to reach more women wanting to go into engineering at both Open Day and Outreach. With hosting these new events, WEM's goal of empowering and creating a support network amongst women-identifying students in engineering and STEM has been surpassed.

As for the 2024 Industry Guide, I would like to dedicate my gratitude to our amazing Industry team for putting in the time and work to make this the best Industry Guide and event possible. They have spent countless hours to make all this planning become reality and so I would like to thank them from the bottom of my heart. I personally thank all the committee for their contributions and willingness to put in the time, hard work and skills to run the club. Without Marketing consistently posting to our socials, Treasury ticking off grants and reimbursements, Secretary keeping us on track with meetings and updating us on promotions and events coming up, Representatives helping us with tasks and promoting WEM to fellow students and staff, Outreach delivering programs to schools for the next generation of women engineers to be greater than before, Events creating a community by displaying both social and academic events and Industry helping WEM to connect and foster connections between students and the industry through networking events, running the club and getting the best out of WEM would not have been possible.

I would like to extend my gratitude and appreciation to our sponsors for supporting WEM's journey and creating events with fantastic opportunities for our members to be part of, and to our members for their support and unwavering commitment to WEM.

I feel extraordinarily lucky and honoured to be in charge and managing the committee this year for WEM. Being in this committee has allowed me to be around very hardworking, persistent, talented, intelligent and amazing women in engineering. For that reason, I'm certain that everyone will achieve great things and hence, I can't wait to see what the future holds.

— Ashali Haputhanthri, *President*

2024 WEM
Industry Overview: Semester 1

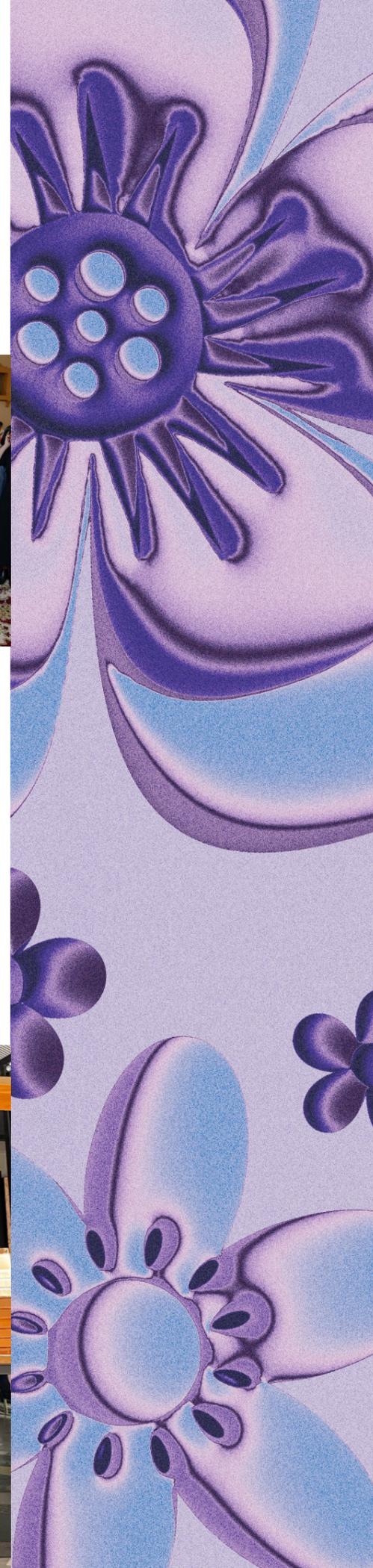By Elise Vayenas, Clare Ahn and Reem Machtoub

Week 2: Networking Trivia Night

Our annual Networking Trivia Night was a great way to start the semester! Having allocated WEM members and representatives from our industry sponsors into teams, attendees utilized this opportunity to solve questions from first-year topics to naming engineering equipment, to even movie questions! As the trivia night ended, the networking session commenced allowing members to ask our Industry Representatives questions and learn more, regardless of whether you are a first-year or final-year student, about a future within the Engineering industry.

Week 8: High Tea Networking

In Week 8, our eagerly awaited annual High Tea event celebrated the theme of Vintage Glamour, infusing the occasion with a touch of classic elegance. Presentations from our platinum sponsors gave students valuable insights into the companies and their unique cultures. Guests, including students and sponsor representatives, indulged in a selection of fine teas and sophisticated high tea treats that radiated timeless charm. The venue, reflecting the essence of vintage glamour, fostered a lively atmosphere for engaging conversations and meaningful networking.

2024 WEM
Industry Overview: Semester 2

By Elise Vayenas, Clare Ahn and Reem Machtoub

Held at GHD's Melbourne Office, the event offered an exclusive CV/Resume review session by GHD Talent Acquisition, providing direct feedback from industry professionals. The engaging interview panel discussions highlighted various career paths and industry experiences, offering valuable insights into the engineering field. Additionally, the networking opportunities allowed participants to connect with professionals and peers, fostering meaningful connections and discussions. The event was not only informative but also offered a glimpse into the work environment and culture at GHD, making it a beneficial experience for all attendees.

O-Week: Aurecon x WEM Panel and Networking Evening

The Aurecon Panel and Networking Evening was filled with great opportunities to learn more about the roles and career opportunities at Aurecon. The presentations and panel discussions from teams within Aurecon's Engineering and Advisory departments were not only engaging and interesting, but also provided valuable insight and reflections highlighting industry experiences, transitions into a career and overall general advice. Moreover, the networking Bingo further allowed students to connect and learn more directly from representatives and other students.

Week 3: GHD x WEM Engineering Career Event

The GHD Engineering Career Event was a remarkable opportunity for attendees to advance their careers.

Week 10: BAE Systems x WEM Women in Industry Panel and Networking Event

Get ready for an inspiring and empowering experience at our final industry event of the year! Join us in Week 10 for the BAE Systems Women in Industry Panel and Networking Event. This is your chance to hear from trailblazing women at "Australia's most versatile defence and security company" and connect with like-minded professionals who are leading the charge in the industry. Don't miss out on the opportunity to gain invaluable insights and make impactful connections. Students from all Engineering and STEM specialisations are welcome! Mark your calendars—you won't want to miss this!

2024 WEM Events Overview — Semester 1

By Yesha Tesoro

Barbie Boat Cruise

In semester 2 of 2023, the committee planned and hosted a boat cruise night with the theme of 'Barbie'. The boat cruise took place along the Yarra River and gave members a chance to dress up as their interpretation of who Barbie is to them. The event was one of the highlights of the semester, offering students a unique opportunity to socialise while enjoying music and the scenery, creating long lasting memories. This event showed how the committee was able to come together and organise a successful event, showcasing the dedication of the committee in fostering bonds within the community.

WEM Bar Night

The WEM Bar Night was an event held in the semester 1 2024 and was held at the beautiful rooftop bar at The Emerald Peacock in the city. The event allowed for members to socialise in a relaxed and casual environment alongside some drinks. The aim of the event was to get members to catch up with one another after the summer break and to ease into the first semester of the new university year. This event was an amazing opportunity for both committee members and WEM members to get together and enjoy the beautiful city at night and make new long lasting friendships.
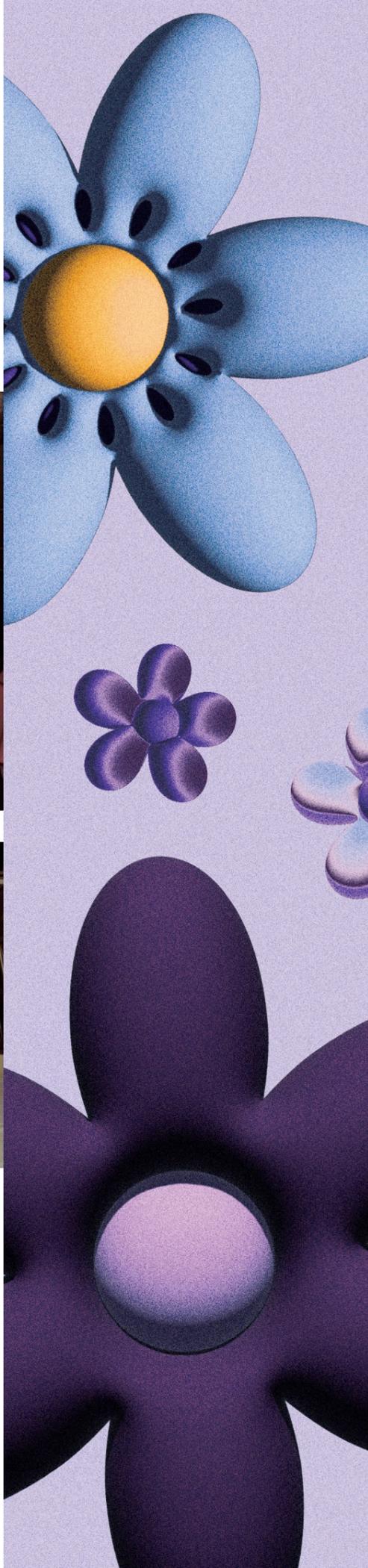
WEM x MUDA Dodgeball and Board Games Night

This event was a collaboration between WEM and the Monash University Dodgeball Association (MUDA) and was a great way for both WEM and MUDA members to come together and play fun rounds of dodgeball and games. The collaboration gave members the opportunity to make new friends and foster a sense of teamwork and camaraderie, highlighting the committee's dedication to doing inter-club activities.

Both WEM and MUDA share similar goals when it comes to inclusivity and by working together, we were able to create a welcoming environment which encouraged participation. This successful event emphasises inter-club cooperation and highlights WEM and MUDA's dedication to creating an inclusive and strong community.

2024 WEM Outreach Events Summary

By Suey Ho, Elise Vayenas, Vicky Huang, Bhavya Pathak and Selsa Sony

MEG — Future Innovators: Girls in Engineering Workshops

WEM collaborated with the Monash Engineering Girls (MEG) to host the Future Innovators: Girls in Engineering Workshops at Monash University. This event brought together 105 women-identifying students from years 9 to 12, offering them a chance to learn about various engineering streams.

The day commenced with a campus tour, where WEM guided a group of students through the Innovation Labs, Makerspace, and Design and Build studio, showcasing the latest facilities available for engineering students at Monash.

WEM organized a power tools workshop, teaching students how to make a wooden laptop stand. For most students who attended, this was the first time using power tools, so it was a very useful learning experience. The workshop also provided an opportunity for students to interact with WEM members and ask them questions about life at the university, engineering courses, and career possibilities.

GHD STEM Pathways Program

WEM had the privilege of participating in the GHD STEM Pathways Program held at the GHD Geelong Office. This week-long event was designed to give year 10 women-identifying students an opportunity to explore potential STEM pathways.

The highlight of the session was a hands-on activity where students worked in teams to construct claw machine claws from cardboard. This exercise encouraged creativity, teamwork, and problem-solving. Some students who managed to construct working claws tried to pick candy from a bag with them. This interactive activity not only engaged the students but also demonstrated the practical aspects of engineering.

Strathcona Girls Grammar

WEM also took part in an outreach event at Strathcona Girls Grammar. Year 12 students participated in a hands-on challenge that gives them a taste for what it's like to be an engineering student, motivated by a first-year project from Monash University. It wasn't just a creativity activity but gave them a feel for what it could be like to study for an engineering degree.

At the core of every outreach event, WEM representatives bring something unique and invaluable—their personal stories. Across the GHD STEM Pathways Program, the Future Innovators: Girls in Engineering Workshops, and the Strathcona Girls Grammar event, WEM representatives have shared their individual journeys into engineering. They provide a relatable and inspiring perspective to young women who are considering STEM pathways.

These shared experiences go beyond just technical advice; they offer insights into course selection, university life, and the importance of getting involved in student clubs and teams. Through these personal connections, WEM aims to demystify the engineering career to prove that it is not only attainable but a fulfilling profession.

WEM is committed to fostering a love for STEM among young women, and these outreach activities are just the beginning. By offering hands-on experiences, sharing personal journeys, and providing insight into the world of engineering, WEM will continue to inspire and empower the next generation of female engineers. WEM hopes that with every event, it can spark curiosity, build confidence, and eventually convince more young women to follow their passions in STEM.

	aurecon	LOCKHEED MARTIN	MONASH MATERIALS SCIENCE AND ENGINEERING	Invetech	GHD	ANSTO	BAE SYSTEMS	wood.	S&C
Aerospace Engineering		✓				✓	✓	✓	
Biomedical Engineering			✓	✓			✓		
Chemical Engineering	✓				✓		✓		
Civil Engineering	✓				✓		✓	✓	
Consulting	✓				✓		✓	✓	
Electrical & Computer Systems Engineering	✓	✓		✓	✓	✓	✓	✓	✓
Environmental Engineering	✓				✓		✓		
Materials Engineering	✓		✓	✓	✓		✓	✓	
Mechanical Engineering	✓	✓		✓	✓	✓	✓	✓	✓
Robotics & Mechatronics Engineering	✓	✓		✓	✓	✓	✓	✓	
Research		✓	✓			✓	✓		
Resources Engineering					✓		✓		
Software Engineering	✓	✓		✓	✓	✓	✓		
Hiring of International Students	✓		✓		✓			✓	
Interstate Opportunities	✓		✓		✓	✓	✓	✓	
International Opportunities	✓		✓				✓	✓	

	beon / CitiPower / Powercor / united energy	ARCADIS	ExxonMobil	Stantec	BCG	AURORA	ATLASSIAN	Honeywell
Aerospace Engineering			✓			✓		
Biomedical Engineering			✓			✓		
Chemical Engineering		✓	✓	✓		✓		✓
Civil Engineering		✓	✓	✓		✓		
Consulting		✓			✓	✓		
Electrical & Computer Systems Engineering	✓	✓	✓	✓		✓		✓
Environmental Engineering		✓	✓	✓		✓		
Materials Engineering		✓	✓			✓		
Mechanical Engineering		✓	✓	✓		✓		✓
Robotics & Mechatronics Engineering	✓		✓	✓		✓		✓
Research						✓		
Resources Engineering			✓			✓		
Software Engineering		✓			✓	✓	✓	✓
Hiring of International Students	✓	✓	✓	✓		✓		
Interstate Opportunities		✓		✓		✓		
International Opportunities		✓				✓		

Are you ready to launch your *career adventure?*

At Aurecon, we believe that every career should be a rewarding adventure. Our early careers programmes have been carefully designed to provide the best and most meaningful experience for our graduates and interns to guide them along the way.

Graduate programme

Our two-year programme delivers a fun learning experience for graduates like you as you shape your professional career. As a permanent employee, you will have access to learning opportunities to develop essential skills, including: a variety of internal educational resources available at Aurecon; mentorship and coaching; and real work experiences, preparing you for the future and helping you grow both personally and professionally.

Graduate applications open: February 2025

Intern programme

Over the 12-week summer programme, you will have opportunities to harness your skills, work on actual projects, enhance your knowledge base, and receive structured feedback from your team leader and mentors. This is your chance to step outside of your comfort zone, build your network, and explore different pathways that you may want to pursue after finishing your degree.

Internship applications open: June 2025

READY?

aurecon
Bringing ideas to life

aurecongroup.com/careers

Aurecon is a place where you can belong

People are at the heart of everything we do—the people we work with and the people we design for—and we love our differences.

Each person should be able to develop and have equal and equitable access to opportunities and celebrate what makes them unique. This is what helps them bring their most innovative ideas and become the best at what they do.

Gender equity & equality

We are working to improve the gender balance and equality of our leaders and workforce. While this is a journey, we continue to make progress on our goal to disrupt gender expectations and norms and seek genuine choice and opportunity for all employees. Some of our gender equity and equality initiatives include pay parity audits to close the gender pay gap, increasing female representation across all levels of staff including our leadership team.

- **LGBTQIA+ inclusion**

   We are proud advocates of LGBTQIA+ inclusion and are committed to creating an inclusive workplace where we value, respect and support all employees. We are building a culture that rejects harassment, bullying, discrimination, and stereotypes and actively supports difference, builds connections, and provides psychological and cultural safety. Aurecon has co-founded different networks such as Aurecon Pride for our employees, InterEngineer for professionals in Australia, and LGBTI+ in STEM in New Zealand.

- **Indigenous inclusion**

   Aurecon deeply respects and acknowledges the First Peoples of Australia and New Zealand. Our commitment is to create sustainable and meaningful relationships with Aboriginal and Torres Strait Islander peoples in Australia, and Māori and Pasifika in New Zealand.

Work on real-life projects alongside industry leaders

Aurecon designers, engineers, scientists and advisors work with our clients across to tackle some of the world's most complex challenges. This is how we create a positive legacy.

Monash University Woodside Building

Aurecon's integrated design approach helped Melbourne's Monash University bring to life the innovative Woodside Building for Technology and Design, the largest educational building in the world to achieve Passive House certification.

Project Gilghi

Aurecon partnered with Ampcontrol to create a breakthrough hybrid off-grid water purifying system for use in remote Indigenous communities. Gilghi is a containerised water treatment plant. It innovatively combines renewable energy requirements with water treatment and sanitisation and aims to improve Indigenous health and access to sustainable clean drinking water.

Allianz Stadium

Sports and entertainment is being enjoyed in the modern-day engineering and architectural marvel of the new 42,500-seat Allianz Stadium. Aurecon was the structural and civil engineer, designing the stadium with steep seating to bring fans closer to the action, all undercover, with the seating pattern designed by award-winning Indigenous artist Tony Albert.

Scan the QR code for more updates on our Early Careers programmes.

aurecon
Bringing ideas to life

To learn more, visit www.aurecongroup.com/careers

LOCKHEED MARTIN
AUSTRALIA

Lockheed Martin Australia is an industry leader in defence and technology. Are you looking for a career that puts you at the front line of innovation?

A career with us could take you in directions you never could have imagined. At Lockheed Martin Australia, we are part of a global team that makes an impact everyday – our collective strengths make a difference in the lives of one another, our customers, our community and our planet. We are at the forefront of helping to solve the world's most complex defence and security problems.

We're proud of our inclusive and collaborative culture that embraces and celebrates our people's differences. Most importantly, we live by our values of Do What's Right, Respect Others and Perform With Excellence every day.

Lockheed Martin graduates and interns are driven and ambitious team players, passionate about building a better tomorrow.

Workplace Diversity

Lockheed Martin has long embraced both equal employment opportunity and affirmative action. The company has a variety of employee networks, employee resource groups and leadership groups.

We do not discriminate based on race, ethnicity, national origin, age, religion, sex, disability or marital status when hiring, promoting and training employees. Our affirmative action programs seek to identify and break down barriers, both visible and invisible, creating an even playing field where everybody has a fair chance to reach their full potential in contributing to our business.

Current Projects

We deliver exceptional program performance and leading innovation for Australia across a broad range of environments and domains in the aerospace, defence and civil sectors.

Lockheed Martin's diverse programs form a critical backbone of Australia's current and future defence capabilities including Next Generation Pilot Training, Advanced Guided Weapon Systems, Combat Systems Integration, Rotary Wing Systems and Sustainment, 5th Generation Air Combat Capability and surveillance across air, sea, land and space.

We know it takes a diverse, collaborative team to deliver our programs. That's why we need graduates and interns who are driven, ambitious team players who are as passionate as we are about building a better tomorrow - today.

Graduate or Internship Program

Lockheed Martin Australia has consistently been recognised as one of the top graduate employers in the nation. Our award-winning Graduate Development Program is designed to expose graduates to unique learning opportunities, whilst contributing to stimulating, ground-breaking projects.

To learn more, visit www.lockheedmartin.com

We partner with Australia's research and industry communities to support our global supply chains, providing opportunities for technology transfer, innovation, local skilled jobs and business growth. Our graduates have the opportunity to be engaged with all these facets of our business.

All Lockheed Martin Australia graduates participate in the two-year Graduate Development Program, with our cohorts commencing in either February or mid-year.

All graduates benefit from the Program's many features, including:

* Permanent full-time employment at Lockheed Martin Australia from Day 1

* A team role in a cutting-edge program

* A 'buddy' to help start the journey with Lockheed Martin Australia along with a structured induction program tailored to the graduate cohort

* A designated mentor for ongoing career advice and support

* A supportive environment where all our leaders are provided with development in leading early career starters and creating a learner centred environment

* An individualised on-the-job training program covering job-specific processes and techniques

* A graduate development program involving contemporary training spanning leadership development, communication and technical skill development

* Psychometric profiling using insights that enhances their ability to read people and adapt their communication accordingly

* Access to leading technology and thought leadership both face-to-face and virtually

* A competitive starting salary with regular reviews

* A commitment to work/life balance with a 9-day fortnight with flexible working hours

* New starter interviews three months after joining to check in on how they have settled into the organisation

For those still studying towards a relevant degree at an accredited university, Lockheed Martin Australia also offers its Industry Based Learning Program. This six month full-time program is aimed at providing you with work experience within a program environment.

"The people I work with are so lovely and welcoming, which has made the transition to the professional world far easier than I ever expected. Lockheed Martin encourages perpetual learning and knowledge sharing. This has been invaluable to my professional development. I've been able to work on many interesting projects that bring me a sense of satisfaction and achievement from my work; it feels like the work I do really matters. I've also deeply enjoyed the opportunities I've been given to inspire the next generation through my involvement in programs such as Science Alive and the WiSTEMS Industry night. I am excited to discover where my career with Lockheed Martin will take me in the future." — Sahara

Further Information

To hear about our exciting early career opportunities such as internships, industry based learning placements or the graduate development program visit:
www.lockheedmartin.com/en-au/careers/early-careers.html

MATERIALS SCIENCE AND ENGINEERING

PHD & MASTERS SCHOLARSHIPS

Monash University's Department of Materials Science and Engineering is an international, research-active department with modern facilities and a broad education offering in materials science and engineering. Although our work spans the entire materials field, we specialise in both the cutting-edge and fundamentals of metals and alloys, biomaterials and tissue engineering, nanomaterials, polymers, composites, corrosion, advanced materials characterisation and materials modelling. Our department is well known for our outstanding facilities, integration of practical and theoretical learning, student-run teams and our focus on people and the community.

Materials scientists and engineers make a unique contribution – not just by making new materials, but also by improving what we already have. Here at Monash, our graduates and researchers are making things stronger, lighter, more functional, more sustainable and more cost-effective. Their contributions underpin all aspects of engineering, manufacturing and health sciences. Not surprisingly – they're increasingly in demand.

HISTORY

The department of Materials Engineering was officially launched in 1971 with 16 students and by 1980 had the largest research group in the Faculty of Engineering. The department has since gone through a number of incarnations before officially becoming the Department of Materials Science and Engineering in 2013. In 2024, according to the Academic Ranking of World Universities, the department was ranked number two in Australia and 33 globally for materials science.

EMPLOYEES

Our department is made up of 35 academic staff (26% female). We have 127 Bachelors of Materials Engineering students (42.5% female), and 126 PhD students (35% female). Students and staff join our department from more than 40 countries around the world. Our department is largely based at Monash University's Clayton Campus and this places it within walking distance of the CSIRO's Clayton Central precinct, the Australian Synchrotron and the Melbourne Centre for Nanofabrication. Most of our researchers are located within the New Horizons research centre, a collaborative research environment designed to create new multi-disciplinary research opportunities for industry, engineers, scientists, researchers and

government. We have several key academic staff working at our Suzhou Research Institute Campus.

Diversity is actively pursued in MSE, through academic recruitment and by providing a family friendly and open environment for staff and students. This is reflected in, for example, our gender balance which is higher than in other engineering disciplines. For example, female students in engineering disciplines in Australia are around 16 % compared to 42.5% in MSE.

COMPANY VISION/FUTURE GOALS

Over the next five years we would like to grow our student base by the introduction of new, cutting-edge materials courses and minor specialisations at the undergraduate and postgraduate levels. We will achieve this by showcasing the exciting careers that Materials Engineering graduates are pursuing and diversifying our course offerings.

An example of a project we are working on is material development for the 3D printing of cells for tissue engineering applications. Many materials used today are derived from animals, such as gelatin. Our work is to design synthetic materials which can replace animal derived products using polymer science and the principles of biomimicry. Eventually, we expect that these types of materials can be combined with cells and developed into 3D printed

constructs that have some level of tissue function. We are also working on relacing animal derived materials in organoids for drug screening. Organoids are disease models which contain tissue relevant cells and structures.

WHAT SETS MSE APART?

Our department prides itself on building life-long relationships with students, from enrolment through to alumni. We actively promote diversity and inclusion at all levels. We are strongly engaged with industry providing students with opportunities to engage through a variety of programs as well as providing cutting edge solutions through our research. Our department is committed to producing research outcomes that are in the public good. This includes the research and development of materials which help mitigate the effects of climate change, reduce the impact of environmental pollution and aid in the treatment of diseases.

Q&A

What type of people succeed in Research?

Successful researchers come in many varieties but often share some common traits. These include being innately curious about the world, creative, able to clearly communicate with experts and non-experts alike, sensitive to the wants and needs of others and excellent at organising their time.

THE OPPORTUNITY

Expressions of interest are sought from outstanding candidates interested in undertaking research studies in Materials Science and Engineering at Monash University.

Our PhD and Masters by Research degrees are a great opportunity to work on a significant research project under the direction of world-leading researchers. These postgraduate research degrees allow you the opportunity to work in a flexible, highly self-directed way, to gain high level transferrable skills whilst working on a program which results in new knowledge contribution and the opportunity to develop new, cutting-edge technologies. We have projects in the areas of energy materials, metals and alloys, biomaterials, additive manufacturing and functional materials. Our department is ranked the No.2 Materials Department in Australia, and we have state-of-the-art laboratories for materials research, with centres for electron microscopy and additive manufacturing. We also have a number of research clusters (metallurgy and corrosion, engineered biological models and system) which provide development opportunities, shared mentoring as well as opportunities to develop collaborative linkages and networking.

TOTAL SCHOLARSHIP VALUE

A $35,013 per annum (tax-free) (2024 rate). Tuition scholarships available to international students.

SCHOLARSHIP REQUIREMENTS

There are separate scholarship rounds for local (domestic) and international students. To be eligible to apply for domestic postgraduate research scholarships an applicant must be an Australian citizen, New Zealand citizen or a Permanent Resident of Australia. International postgraduate research scholarships are available for non-domestic applicants that cover both living allowances (stipend) and tuition (international student fees).

ELIGIBILITY REQUIREMENTS

Applicants will need to hold a first-class honours degree from an Australian University or equivalent degree from an overseas university in a relevant discipline.

Full details for the relevant requirements are available at:
monash.edu/graduate-research/future-students/apply

TO RETAIN THIS SCHOLARSHIP

The recipient of this scholarship must maintain satisfactory academic progress throughout their research degree.

APPLICATION PROCESS

The first step in the application process is to identify a potential supervisor.

Research profiles of academics in the department can be found at:
monash.edu/engineering/ departments/ materials/about-us/our- people/ academic-staff

Once you have identified a potential supervisor, email them with your CV to discuss potential projects on offer. Next fill in an expression of interest form (need link). Academics will then issue a formal invitation to apply which you can use to start the online application process.

APPLICATION DEADLINES

The yearly scholarship application deadlines are:

International: 31st March & 31st August
Domestic: 31st May & 31st October

ENQUIRIES

Enquiries about the scholarship application processes can be directed to:

Faculty of Engineering Graduate Research Office
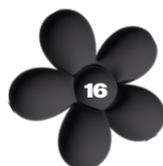
✈ eng-gradresearch@monash.edu
📞 +61 3 9905 5222

MORE INFORMATION

Find out more about PhD and Masters by Research degrees and scholarships at:
monash.edu/engineering/future-students/graduate-research/phd

MATERIALS SCIENCE AND ENGINEERING

✈ MSE.Enquiries@monash.edu
📞 +61 3 9905 4941

MONASH MATERIALS SCIENCE AND ENGINEERING

Invetech

Company Overview

For over 35 years, Invetech has provided technological innovation and product solutions to clients in Australia and throughout the world. Working initially across all product sectors including automation and consumer products, Invetech now focuses primarily on the healthcare, diagnostic products and cell & gene therapy markets.

Today we work with companies ranging from innovative start-ups to multinational corporations, translating their ideas into successful products. We are inspired by our clients' life-changing innovations and committed to working together to revolutionize the future of human health.

Our collaborative, integrated approach resolves complexity and informs better decisions, adding value for our clients, and ensuring high-quality products and therapies get to market faster and with greater certainty, reliability and efficiency.

Invetech works with clients to establish and capture the needs of the intended product user, to design robust and manufacturable engineering solutions, and to offer a path to longer term manufacture of the product through our contract manufacturing capability.

Invetech's head office is in Mount Waverley, Melbourne, which also houses our main design engineering and contract manufacturing hub. Our North American office, located in San Diego, CA, also offers full engineering capability and hosts our sales and marketing team. Both sites provide multidisciplinary science and engineering teams with multiple general purpose and specialized laboratories for product development.

Invetech complies with and is certified under ISO 9001 and ISO 13485 Medical Devices – Quality Management Systems.

Our development projects take several forms, including full product development from inception to manufacture for companies who have innovative science or chemistry and need it turned into a product, to clients who already have working prototypes but need detailed design for manufacture and assembly, to next generation development of existing product lines.

Invetech's strengths are depth of technical coverage in multiple engineering disciplines, breadth of experience in all stages of product development and a strong consultative and collaborative approach to engaging clients. Our engineers come from many engineering and science disciplines and contribute to our key engineering capabilities in systems engineering, instrument architecture, optics, motion control, thermal engineering, fluidics, microfluidics and user experience. We are all united by a value system that is centered around collaboration, innovation, excellence, enthusiasm and integrity, which we apply to live up to our shared purpose:

Making Healthcare Innovation Happen.

Workplace Diversity

Invetech articulates its focus on safety, respect and inclusion in recruitment materials, contracts and performance management frameworks and consults with team members on workplace issues concerning gender equality, diversity and inclusion. Team members are recognised and rewarded for their modelling of safe, respectful and inclusive conduct. Further, Invetech genuinely supports flexible working and balancing of caring and work responsibilities for all workers, including organisational leaders.

At any time, Invetech runs several development projects across its focus areas of healthcare, medical diagnostics, life science and cell therapies.

An example of a recent exciting project was the development of an instrument enabling a rapid, molecular diagnostic test (PCR) for the identification of the SARS-CoV-2 virus that could be run by non-medical personnel. The objective was to get to market as rapidly as possible with a fully functioning platform to help address the critical need for diagnostic testing.

We needed to:

- Establish the platform architecture and define product requirements through to transfer to manufacturing;

- Address key technical risks associated with integrating an existing mature sample preparation protocol and consumable into an integrated one-off use cartridge;

- Develop a device that met core requirements and was both simple to use and able to scale in production;

- Build an instrument that could be scaled effectively to be manufactured in large volumes, shipping at a rate of thousands per month.

Leveraging prior experience and through our dedicated knowledgeable workforce, we were able to successfully deliver for our client a fully functioning diagnostic instrument, transfer it to manufacture, along with the associated disposable cartridge, within eight months of commencing.

Graduate and Internship Programs

Invetech supports a summer Intern program almost every year. Successful applicants are placed within operating project teams and contribute to the development of real products, working alongside experienced engineers from their engineering discipline assigned to the project.

Additionally, each intern is assigned a buddy and a mentor. The buddy assists the intern settle in, getting to know the people and facilities and how to get things done in the company environment. The mentor is an experienced senior engineer who can advise on longer term growth and development and may offer suggestions for improvement and broader opportunity.

Typically, an intern may assist in the assembly, integration and testing of testbeds, prototypes or fully designed instruments, depending on the stage of development of the product. They may also conduct engineering calculations, procure parts, complete scripting or engineering design, and contribute to project documentation, all under the guidance of the project engineers.

As Invetech works in several regulated areas, all our staff, including our interns, are required to comply with regulations and work to procedures in place to ensure the quality and conformance of our work and our products. Interns are provided training in our company standards. These include quality procedures relevant to the work they will be conducting, as well as topics covering Environmental Health and Safety (EHS), confidentiality, ethical conduct, inclusivity and diversity, and training on how to use day to day tools used in our work.

We consistently receive feedback from our interns that they greatly value the opportunity to work in a hands-on engineering development environment where their work directly contributes to tangible outcomes in improving people's lives through better healthcare products, diagnostic outcomes and cell therapies. Many former interns go on to be employed by Invetech or similar companies working in new product development throughout Australia.
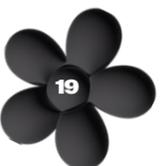
Further Information

There are three categories of AI/Machine Learning (ML) technologies being used within our organization:

1. **Integrated into the medical diagnostic devices we design.** For example:
- A device with a digital microscope uses AI/ML to classify and quantify harmful pathogens in a patient sample.

- A Next-Generation Sequencing (NGS) genomic sequencing system uses AI/ML extensively to detect patterns in DNA

- A robotic subsystem in a device is equipped with a vision system for detecting when insufficient sample has been delivered to the device, preventing a false-negative result

2. **Integrated into our tools.** For example, generative AI assists us in concept generation for visual appearance digital mock-ups and generative text AI products help engineers rapidly come up to speed in new areas they have not worked in.

3. **We are experimenting with AI as a first-class product** – for example, how we might solve the problem of hallucinations by generative AI. See this blog post: https://mattyyeung.github.io/deterministic-quoting

For an overview, see this talk by Damian Verdnik, VP Diagnostics, discussing the past, present and future of AI in our field: https://www.linkedin.com/posts/invetech_tricon-machinelearning-ai-activity-7186431587633303552-943I?utm_source=share&utm_medium=member_desktop

How is the industry changing and what can future engineers do to prepare for these changes?

Our field is becoming more technologically diverse. Our solutions involve many technologies, combining several engineering disciplines, sciences and beyond. As the pace of change grows, engineers who are adaptable, have broad experience and learn quickly will succeed.

To learn more, visit https://www.invetechgroup.com/

To learn more, visit https://www.invetechgroup.com/

We're GHD.

At GHD, we're committed to making water, energy, and communities sustainable for generations to come. Our commitments anchor us to what is truly important. They give us insights into the best ways to partner with our clients to solve the world's biggest challenges.

Commitment is how we grew from a small engineering practice in Melbourne, Australia, in 1928 into a global professional services company today with over 11,000 employees in 200 offices on five continents: Australia, Asia, New Zealand, the Americas, Europe, and the Middle East.

No matter where our work takes us around the planet, whether we're partnering on a local initiative or a global infrastructure project, we're helping create lasting community benefit. And that's why our work is more than just a job — it is an unshakable belief in the future we're building.

Renowned for our core values of Safety, Teamwork, Respect and Integrity, we have grown into one of the world's top employee-owned professional services companies. Our employee-owned status is a powerful point of differentiation and helps drive our passion and accountability in how we serve our clients, deliver projects, and pursue new opportunities.

GHD is the place for aspiring people to thrive, achieve their career goals, and make a lasting impact.

A culture where people can thrive

As a people-powered business, GHD strives to be an inclusive community where everyone feels they belong. Embracing diversity helps us develop imaginative and responsive solutions that create lasting community benefit.

Our pursuit of gender equity in a traditionally male majority industry has continued since 2014 when female employee targets were first set. To drive a more equitable workplace, we developed a flexible parental leave and return to work policy. In 2007, we established the Women in GHD (WinG) network to empower our women. Today WinG operates across all our offices globally, providing a space for women to connect, inspire and grow.

In 2016, we established a National LGBTQIA+ Employee Resource Group, which is now supported by a growing network of more than 270 official GHD LGBTQIA+ allies across Australia. Since the publication of our LGBTQIA+ Action Plan in 2021, we have developed an e-learning module, partnered with Out for Australia, improved the induction process for new allies, and normalised the use of pronouns through email signatures, business cards and introductions during events. Our long-term membership with Pride in Diversity has helped guide and steer our LGBTQIA+ inclusion awareness training, enablement, policy change and initiative roll-out.

In 2022, we increased our strategic hiring efforts and have grown our Indigenous workforce to ensure we have Aboriginal and Torres Strait Islander peoples engaging with our people, communities,

To learn more, visit https://www.ghd.com/

businesses and clients. As a result, we are closer to achieving our 1.8 percent Indigenous employment target as outlined in our Reconciliation Action Plan.

As well as developing a Hybrid/Remote Work Policy to foster wellbeing, flexibility and productivity, our Young Professionals Network continues to provide a platform to help early career professionals build strong working relationships. And through our partnership with Neurodiversity Hub, we're supporting and providing employment opportunities for neurodiverse people. As a next step in our I&D journey, a global accessibility working group has been formed to help create a more accessible environment within GHD.

What we're working on

At GHD, our driving force is our vision: to make water, energy and communities sustainable for generations to come. Here's how we're making it happen.

- **Kidston Pumped Storage Hydro Project**
  This world-first project will re-purpose an abandoned gold mine into a pumped storage facility to deliver clean energy to Queenslanders.
  Read more

- **Designing Perth's new Airport Line**
  This rail line is a game-changer for Perth, connecting the airport and the city's eastern suburbs with the rest of the urban rail network.
  Read more

- **Hornsdale Wind Farm and Battery Storage**
  Consisting of 99 wind turbines and the world's largest battery connection, this renewable energy project in South Australia is making energy sustainable for future generations.
  Read more

- **Wurun Senior Campus**
  Re-purposing the historic Fitzroy Gasworks site in Melbourne, this vertical campus cleverly connects indoor learning spaces with the outdoors.
  Read more

Graduate and Internship Programs

Commitment defines how we do business, how we serve our communities and how we care for one another. When you join GHD, we commit to encouraging your curiosity, fostering new ideas, and creating meaningful change.

All new-to-workforce grads are enrolled in our 2-year Graduate Development Program, which helps you become familiar with life in a consultancy. You'll be part of a global class that transcends disciplines and regions, helping you form your network within the business. You'll also meet and interact with senior leadership, learn how to access internal resources like employee groups and other training, and understand what the opportunities are for you to shape your career.

"I've been out in the field mentoring our young professionals to visually inspect airport pavements for defects that have the potential to deteriorate an airfield's service life. This practical approach has taught me more as a young professional than I would have learned by just being in the office environment."

— Christina Hayes, Brisbane, Australia

Whether it's through our Corporate Social Responsibility program, GHD in the Community, or our design-led innovation program, Smart Seeds, we give our people the opportunity to help make a positive social and environmental impact on the communities in which we operate.

To discover where a career at GHD could take you, visit www.ghd.com/careers

![ANSTO logo with Australian Government]

Company Overview

ANSTO is the home of Australia's most significant landmark and national infrastructure for research. Thousands of scientists from industry and academia benefit from gaining access to state-of-the-art instruments every year.

ANSTO operates key Australian infrastructure including one of the world's most modern nuclear research reactors, OPAL; a comprehensive suite of neutron beam instruments; the Australian Synchrotron; the National Imaging Facility Research Cyclotron; and the Centre for Accelerator Science.

The Australian Synchrotron is a major research facility located in Clayton, a technology and innovation hub of southeast Melbourne. It produces synchrotron radiation, a form of electromagnetic radiation that spans a broad range of wavelengths, from infrared to X-rays, which are used in individual experimental facilities to examine the molecular and atomic details of a wide range of materials. The advanced techniques are applied to research in many important areas including health and medical, food, environmental science, biotechnology, nanotechnology, energy, mining, agriculture, advanced materials and cultural heritage.

Workplace Diversity

ANSTO is very active with diversity and inclusion as it strives to enhance the workplace and its community. One of the initiatives has been the women in engineering internship program that involves networking with universities to connect with women studying engineering. This program has been a massive success with a total of 12 interns over 5 years. Additionally, ANSTO in looking into initiatives that foster cultural and neuro diversity.

Current Projects

ANSTO's current BRIGHT project aims to facilitate the design and installation of eight additional beamlines, of which four have now been completed, enabling the facility to meet the needs of Australian researchers and industry partners and continue enabling ground-breaking research well into the future. To find more information about the research and case studies the synchrotron is discovering, please visit: https://www.ansto.gov.au/facilities/australian-synchrotron/synchrotron-case-studies

Graduate and Internship Programs

ANSTO's highly-regarded Graduate Development Program aims to develop and nurture the next generation of Australian business and science leaders. Graduates gain invaluable hands-on experience and professional development opportunities during this 2-year rotation program.

Moreover, most summers the Australian Synchrotron runs a paid women in engineering internship program. This program will allow successful applicants to gain industry experience in a unique and supportive environment. Applications generally open in October. We are looking for students with degrees in:

- Mechanical engineering
- Mechatronics engineering
- Software engineering
- Computer science
- Electrical engineering

Further Information

October 13th 2024, Australian Synchrotron Open day, you will have a rare chance to go behind the scenes of the Synchrotron. There will be opportunities to:

- Learn how the Synchrotron works and the amazing research it enables
- Talk to our scientists stationed at the beamlines
- Interact with ANSTO scientists, engineers and technicians

Company Overview

For over 70 years BAE Systems has built a strong company and a legacy supporting the Australian Defence Force. BAE Systems has more than 5,800 talented and experienced people delivering valuable and significant work in over 40 sites Australia wide. BAE Systems is committed to growing its capabilities, products and services and its support for local communities. It continues its legacy of excellence through investing in its people, while developing new technologies and innovations that will help tackle future challenges by making the impossible possible.

Workplace Diversity

BAE Systems values an inclusive workplace; enabling its people to bring their whole selves to work. Through a focus on procurement opportunities and community consultation, BAE Systems Australia builds respectful and sustainable relationships with First Nations peoples in the communities in which it operates. Implementing a Reconciliation Action Plan (RAP) stands central in its commitment to advancing its reconciliation journey in practical ways, including partnerships with First Nations owned companies; and increasing the number of First Nations employees.

Employee resource groups 'Outlink' plays a crucial role in its diversity and inclusion program through raising awareness of and advocating for issues specifically facing LGBTQIA+ people. It currently employs about 18,000 women across its global business, but its aim is to attract many more women to join at all levels of the organisation. BAE Systems is increasing its gender diversity and have set an ambition to be a leading employer in defence and security for valuing diversity, equity and inclusion.

Graduate and Internship Programs

BAE Systems Australia offer Intern and Graduate Programs. These programs allow you to gain valuable industry experience and work on real-world defence projects. It's not just a job – it's a chance to kick-start your career of Infinite Possibilities™.

Intern Program

- A 12-week paid summer internship program or a non-summer placement or industry project to support your academic studies during the semester.
- Structured learning goals through your internship
- Collaboration with key stakeholders within the business, team members, graduates and other interns across Australia.
- Applications open January for the summer program
- Expression of interests available for all internship intakes all year round
- Early consideration for graduate opportunities
- Awarded "AAGE Top 20 Intern Programs (51+ interns category)" in Australia

Graduate Program

- 2 year structured program with streams offering rotations and interstate placements
- Dedicated career mentor to support career development
- Extensive personal effectiveness and technical training and development
- Dedicated graduate committee providing opportunities for outreach and engagement with the current graduates and alumni.
- Applications open February
- Awarded Prosple #1 Defence & Aerospace graduate employer

wood.

Company Overview

With 35,000 professionals across 60 countries, we are one of the world's leading consulting and engineering companies operating in the Energy and Materials markets. Our key areas of focus include carbon capture and storage, hydrogen, oil and gas (upstream and downstream), power, life sciences, and minerals and metals. Our business began in 1848 when Matthew Hall opened a leadlight business, becoming an early specialist in plumbing and sanitation in the UK. After numerous mergers, acquisitions, and divestitures, the organization evolved into the global enterprise we know today. Our global headquarters are located in Aberdeen, Scotland, with Australian offices in Brisbane, Melbourne, and Perth. We are among the few organizations in this sector that provide an end-to-end solution from concept to construction, exclusively using our own personnel

Workplace Diversity

One of our sustainability goals is to improve gender balance, aiming for 40% female representation in senior leadership roles by 2030. Currently, we stand at 25%, indicating progress but also room for improvement. An exciting project we are involved in is with Newmont, the world's largest gold mining firm, to enhance the Lihir gold mine in Papua New Guinea. We support Newmont's capital works program, including projects to maintain and improve the condition and performance of the Lihir operation. Over the next five years, we aim to achieve several sustainability goals by 2030: improving gender balance with 40% female representation at senior leadership roles, reducing our carbon emissions by 40%, eliminating single-use plastics in all offices by 2025, and contributing $10 million through time, resources, and funding.

Our work environment supports and encourages learning and development with a dedicated 25 hours for graduate training over the 2-year program, in addition to any technical training. Graduate managers receive a briefing before a cohort starts to articulate the learning and development requirements. Our grad program and internships stand out by offering a Certificate IV in Project Management, five induction workshops, five development workshops, and financial wellbeing training. We also have a vibrant early careers community that arranges numerous social and learning events. Hear from our graduates and interns: An engineering intern shared, "Interning at Wood enabled me to contribute to diverse projects and hone my technical skills in a positive and supportive work environment." An HR graduate stated, "Working at Wood as a graduate not only provides us with a number of door-opening opportunities but also encourages cohort engagement and fun along the way!" An engineering graduate described their experience as a "challenging adventure doing interesting and technical work."

Further Information

For those interested in joining us, the application deadlines are as follows: for the summer vacation program, applications open on July 29, 2024, and close on August 25, 2024. For the graduate program (2026 intake), applications open on February 24, 2025, and close on March 23, 2025. For more information, visit our website at https://careers.woodplc.com/early-careers or our page on GradConnection at https://au.gradconnection.com/employers/wood/.

S&C ELECTRIC COMPANY

Empowering People, Transforming the Grid

S&C is a global provider of equipment and services for the electric power industry. Our solutions are an essential part of the electrical grid that brings power to homes and businesses. Since the company's founding in 1911, S&C has championed innovation, introducing unique technology that minimises the impact of — and even prevents — power outages.

Utilities today are working to integrate renewable energy sources, address peak loading issues, and manage the demand aberrations of plug-in electric vehicles. S&C is innovating technologies essential to the transformative change of the increasingly dynamic and complex electric grid.

S&C has over 4,000 team members across manufacturing and sales operations worldwide, with a presence in Australia, Asia, the Americas, Europe, the Middle East, and South America. After helping customers for over 60 years in APAC, we launched our local business unit in 2013, headquartered in Melbourne.

Our People-First Mentality

S&C is employee-owned and operates with a people-first mentality. We cultivate an inclusive workplace that inspires trust, teamwork, and belonging within our global workforce and the communities we serve.

Our DE&I Statement declares our dedication to advancing our journey toward a diverse and equitable workplace, focused on five strategic areas:

- Organisational commitment
- Removing structural barriers
- Advancing DE&I education
- Enhanced talent-enablement processes
- Celebrating diversity

Our 2023 engagement survey showcases the inclusive culture here in Asia Pacific:

- 90% of team members would recommend S&C as a great place to work
- 90% of team members are comfortable voicing their ideas and opinions, even if they are different from others
- 95% of team members feel that they are treated with respect at work and believe diverse perspectives are valued and encouraged
- 100% of team members believe S&C is taking action to be socially responsible

What We're Working On

Customer Projects:

- Working with local Australian utilities on protection upgrades and delivering improved network reliability and resilience through the modernisation of aging infrastructure
- Partnering with leading electrical utilities across South-East Asia to enhance network capabilities and performance for fewer power outages
- Collaborating with military and navy facilities to improve switching equipment for advanced operations

Company Projects:

This year, we formalised our decarbonisation goals with a commitment to achieve net zero emissions by 2050 and interim reduction targets by 2030. Our manufacturing processes have been 100 percent powered by renewable sources globally since 2020. Read more about our sustainability efforts in the 2023 Sustainability Report.

Join us as we transform the grid!

Our philosophy is to provide a rounded learning experience that combines commercial, technical and leadership skills training with hands-on experience.

- International Exposure: Work and network with team members worldwide and customers across the APAC region.
- Varied Assignments: Get out from behind the computer to play a hands-on role in delivering projects and engineering solutions in the field.
- Explore Specialties: Develop critical skills and knowledge while exploring various electrical engineering careers.

Students interested in an internship/graduate position with S&C can reach out to APACGraduateProgram@sandc.com and submit an EOI or resume.

Energy's our future, let's shape it together.

Company Overview

As electricity distribution companies we provide safe, reliable and affordable power to 1.9 million Victorian customers every day. We use our network of poles, wires and infrastructure to bring power to homes and businesses across almost 65% of Victoria. We're also the gateway to a clean energy future, dedicated to finding solutions and harnessing new technology to benefit our customers, communities and the environment.

Our head office is based in the CBD of Melbourne and we have 14 depot locations across Victoria.

Workplace Diversity

Work with us, and you'll see that our embedded values underpin a healthy and positive workplace culture where you'll feel you belong right from the start.

We work hard to ensure our organisation is inclusive and diverse, so everyone can feel equally valued and respected at work. That's backed up by our Inclusion and Diversity Strategy, through four key focus areas:

- Inclusion
- Gender diversity
- Aboriginal engagement
- Flexible working conditions

Developing the next generation of women in leadership is vital for gender equality. So we've set gender targets to ensure continuous improvement in representation of both women in leadership and women in each business unit. In addition, we work hard to ensure the process of paying and promotion is both fair and unbiased.

We are proud to be a WORK180 endorsed employer for women and an AAGE Top Graduate and Intern Employer in 2024. Our commitment to helping all women thrive in the workplace includes initiatives such as our Women in Power network, Women in Engineering and Electrotechnology scholarships, free period products in all bathrooms, a generous parental leave policy, and embedded flexible working options.

Current Projects

Underway are industry leading projects in community batteries, demand management, smart charging for electric vehicles (EVs), microgrids, and developing and trialling a LV DERMS system as part of our response to minimum demand risks.

Graduate Program

We believe that what makes our graduate programs unique is the way you're acknowledged as a critical part of the team – right from the start. You'll be valued and rewarded for the skills and smarts you bring to the organisation while being given the opportunity to take charge of your own career trajectory.

We recognise that high achievers thrive when they're supported and empowered. So we've created a structured program that quickly immerses you in real-world assignments.

Electrical and Mechatronic Engineering graduates will get their career off to a great start with four 6-monthly rotations, followed by a 12-month rotation, mini 1-week rotations, a three-day development event, ongoing coaching and mentoring from senior leaders and a personal mentor, a graduate trip, a buddy in your first year and lots more.

Applications open March 2025.
See our profile on GradConnection to read our Graduates stories.

Vacation Program

This program is designed for students who are in their penultimate year of undergraduate studies in electrical or mechatronic engineering.

Taking part in paid work experience provides genuine insight into our network. Working on live projects, you'll gain practical skills and hands-on experience. Available over a 12-week period from November to February. Applications open July — August.

Curious to find out more?
Visit www.powercor.com.au/careers

Create a legacy

Elevate your career through hands-on projects, community impact, and global opportunities.

ARCADIS

Improving the quality of life is what we do at Arcadis. We offer an exceptional Development Program for those Graduates, Undergraduates and Trainees aspiring to work in engineering, environmental science, transport & urban planning, digital, quantity surveying, project management or business consulting. This program is your gateway to a dynamic career across Australia. You'll engage in hands-on and challenging projects from day one, gaining a comprehensive breadth of experience. You'll do meaningful work every day, being part of a community where your contribution matters. You'll create better housing and revolutionising transport systems, to developing iconic spaces and solving the world's most complex environmental challenges.

As part of the program, you'll join our thriving Arcadis Early Careers Group, providing a supportive and social structure to foster new connections and collaborative across teams. Our structured development support ensures you acquire the technical knowledge and professional skills necessary for your role, alongside behavioural skills training to prepare you for future leadership positions. Arcadis' commitment to flexibility and career advancement is evident through various global and local initiatives.

Arcadis strives for diversity in the workplace. We have achieved the WGEA Employer of Choice for Gender Equality citation each year since 2021. We have Affinity Groups designed to drive diversity including our Gender, Pride and Age Affinity Groups.

Learn more about our Early Careers offerings by scanning the QR code:

Learn more about our Early Careers offerings:

Register your details & we'll email you suitable job ads:

Fun facts about Arcadis

36,000+ People Globally
Our 36,000 people include architects, data analysts, designers, engineers, project planners, water management and sustainability experts all working together to deliver integrated and holistic solutions across the full project lifecycle.

40,000+ Projects
We work on more than 40,000 client projects every year, delivering sustainable design, engineering, and consultancy to help our clients solve the challenges of today.

1st Sustainability
We are leading the sustainability agenda, ranked number one in our sector by Sustainalytics for ESG performance, and in the top 1% of firms who have successfully integrated sustainable practices into their business and management systems according to EcoVadis.

30+ Countries
We operate across 30 countries, collaborating across borders to help serve the changing needs of our clients, wherever they are in the world.

1888 Arcadis Founded
Founded in 1888, we have more than 135 years of experience in bringing innovative and sustainable design, engineering, and consultancy solutions for natural and built assets.

€4bn Gross Revenues
Our strategy is rooted in driving impactful growth, generating gross revenues of €4bn in 2022.

![ExxonMobil]

Build your career with us and use your energy to change the world

Our program

ExxonMobil is one of the world's largest publicly traded energy and chemical companies, and our vision is to lead the industry in innovations that advance modern living and a net-zero future. In our Australian businesses we are focused on delivering energy that improves quality of life and meets society's evolving needs, and we are powered by a unique and diverse workforce with pride in what we do and what we stand for.

ExxonMobil Australia offers challenging internship opportunities to students across various engineering disciplines, with the program typically running from March through to November.

What we offer

• A foundational on-the-job experience to expand your knowledge and solve real-life business challenges

• Professional insights into a world-leading global organisation via interactions with industry experts and leaders

• Technical and personal development with access to a world-class suite of training courses

• A dedicated support system of buddies and mentors providing you with regular and structured feedback.

Meet Lucy Levecke, Carbon Capture and Storage Environmental Lead

"I've had an incredible journey at ExxonMobil. My time as an intern is where I discovered my potential as an engineer. The opportunity to contribute to real projects during my internship made me feel valued and whilst it was challenging, I had plenty of support from my mentors who have geared me towards success in my career."

How to join us

Sign up for notifications for upcoming programs via the link or QR code

https://www.exxonmobil.com.au/company/career-opportunities/exxonmobil-australia-internship-program

Supporting Diversity, Equity and Inclusion

ExxonMobil is an equal opportunity employer and values diversity of background and thinking. We encourage applications from all suitably qualified people, and offer excellent benefits and conditions to enable a strong work life balance and support the needs of our employees throughout their career. ExxonMobil Australia acknowledges the Gunaikurnai, Wurundjeri and Bunurong peoples as the Traditional Custodians of the land on which we operate.

![Stantec]

Company Overview

Stantec is a global leader in sustainable engineering, and environmental consulting. We're trailblazers, redefining what's possible, and reshaping the future. Our diverse team collaborates to tackle critical challenges like climate change, digital transformation, and urban resilience. For a whopping 65 years, we've been shaping communities across Australia. With over 2,500 passionate people in our urban and regional dream teams and 450 locations across 6 continents, we're ready to shake up the status quo. As a multidisciplinary firm, we work across multiple sectors and have a global team of experts to call upon.

Workplace Diversity

At Stantec, we create opportunity by inviting, embracing, and celebrating differences. An inclusive workplace enhances psychological safety and improves wellbeing by encouraging all individuals to celebrate their identity and unique voice. Stantec was recently recognised in the Top 101 Workplaces in Australia for Women by Work180. In Australia, we have five chapters of Women@Stantec employee resource groups (ERGs), with additional ERG chapters for Pride@Stantec, LatinosInStantec and Neurodiversity@Stantec.

Graduate and Internship Programs

Our two-year Graduate Development Programme is tailored to equip you with the tools, knowledge, and techniques to grow and flourish as a future leader and innovator.

Our internships have flexibility to fit around your university schedule either summer internships or a casual arrangement.

You'll benefit from and gain access to opportunities like our Developing Professionals Group, company-wide online specialist knowledge groups; access to global industry thought leaders; and the ability to work on projects across disciplines.

Insights from a graduate:

"The team that I work with are the best part of the job. The environment that we work in, it is dynamic, always changing in project objectives and requires new skills and space for growth within the team."

Graduate roles open in March and July each year and interns in July. Dates are to be confirmed and change each year.

Importance of estimating market trends at Stantec

Staying informed about global trends ensures that AEC professionals can adapt, innovate, and create a more efficient, sustainable, and technologically integrated future.

As a global AEC firm, estimating market trends is a critical part of our strategic planning and decision-making process at Stantec. We employ a multi-faceted approach to estimating market trends. This includes having dedicated teams that analyse construction and economic forecast data, monitor leading industry publications and review the latest global news. We collaborate with our internal industry experts and thought leaders to gain foresight and expert knowledge as well as value direct feedback from our clients to understand their evolving needs and expectations. Combined, this allows us to identify patterns, predict strategic growth opportunities and identify potential risks that could have the most impact on our operations.

Our internal research teams provide updates and analysis of market drivers and trends to business development and client facing staff, our risk and legal teams as well as operations leaders, who incorporated it into their decision making at all levels of the company. It informs our strategic planning, helping us make decisions that ensure we remain competitive and continue to meet our clients' needs. By gaining insight into upcoming and future scenarios, we can help prepare the business in advance for any risks as well as take advantage of any early trends adoption to remain competitive in our market. It also fuels our innovation, enabling us to develop new services and solutions that keep us at the forefront of the industry. We believe that our proactive approach to estimating and responding to market trends is a key factor behind our success in the AEC industry.

BCG

Company Overview

BCG, a pioneering force in business strategy, partners with industry leaders to navigate challenges and seize opportunities. We're dedicated to driving organisational growth, fostering sustainability, and advancing societal change. As part of our global family of 30,000 professionals, you'll be at the forefront of innovative consulting, cutting-edge technology, and transformative corporate and digital initiatives.

At BCG, your career is only limited by your imagination. With each project, you're offered a chance to reshape your role and define your trajectory. We equip you with unparalleled resources and mentorship, empowering you to realise your fullest potential and accelerate your career in unexpected ways.

Our offerings span from traditional consultancy to digital tech, environmental initiatives, and societal betterment. Beyond merely meeting standards, we set new ones.

By joining us, you're not only amplifying our clients' aspirations but expanding your horizons. Rooted in our five core principles, we invite you to experience our ethos and explore the vast opportunities that await within our diverse teams.

Kickstart Your Journey at BCG

At BCG, our doors are wide open for budding talents – students and fresh graduates keen on channelling their fervour and zeal into each challenge, irrespective of its magnitude. We're not just hunting for achievements; we're on a lookout for inquisitiveness, eclectic experiences, fresh viewpoints, and a zeal to shatter the status quo.

To learn more about career opportunities, visit our website:
https://careers.bcg.com/search-results

Early careers page:
https://careers.bcg.com/early-careers

AURORA ENERGY RESEARCH

"Aurora fosters an **inclusive**, **multicultural**, and **supportive** environment. Our team consists of **knowledgeable and humble** professionals who generously share their expertise and support one another in **learning**, **growing** and **succeeding**."

Company Overview

From its academic roots, Aurora Energy Research is a thriving, rapidly growing company, currently serving over 600 of the world's most influential energy sector participants, including utilities, investors, and governments.

While we constantly strive to reach new markets and diversify our product portfolio, we are already active across the globe in Asia-Pacific, Latin America, Europe, and North America, working with leading organisations to provide comprehensive market intelligence, bespoke analytic and advisory services, and cutting-edge software.

Workplace Diversity

We are committed to building a company where everyone can achieve their potential in an inclusive and welcoming environment. Through initiatives like our Women@Aurora network and the Aurora Pride group, we strive to provide further support and opportunities for under-represented groups in the energy sector.

Aurora's Global Graduate Programs

At Aurora, you will apply the skills you have developed through your studies to solving some of our clients' most interesting and intricate problems. Through a mix of structured training programs and on-the-job learning, including regular content talks from our experts, sessions with external speakers, and a program of skills-focused training, we will help you raise your abilities to the next level, preparing you to build trusting relationships with clients, develop new business opportunities, nurture teams and communicate complex ideas with crystal clarity.

If you are a final-year university student or recent graduate interested in joining the Aurora Graduate Analyst Program, please visit **auroraer.com/australia-analyst-2025/.**

Applications close on 1 September 2024 at 11:59pm (AEST).

For more information about Aurora, please visit **auroraer.com.** Stay updated with #TeamAurora on our Instagram page **@lifeataurora.**

ATLASSIAN

Company Overview

Atlassian is a leading software company renowned for collaboration tools like Jira and Confluence. As we expand, we will continue to innovate in project management, software development, and team communication, making significant contributions to the tech industry with user-friendly interfaces and customisable features while keeping our mission of unleashing the potential of every team at forefront.

Workplace Diversity

Our focus extends beyond company growth to building diverse teams and ensuring an equitable, inclusive hiring process. Embracing diversity, equity, and inclusion is central to Atlassian's mission, aiming to create a workplace where every individual can thrive authentically. Diversity involves reflecting societal diversity in teams, while equity ensures fair treatment and opportunities for all Atlassians to grow. Inclusion fosters a culture where employees feel valued and heard. Atlassian leverages its leadership position to influence positive change through transparency, policy advocacy, and engagement. The company's commitment to increasing representation involves enhancing the presence of underrepresented candidates in applicant pools and sourcing pipelines. By prioritising diversity, equity, and inclusion, Atlassian strives to empower its employees to deliver their best work.

At Atlassian, we are truly dedicated to creating a workplace where every individual can thrive authentically. Our commitment to diversity, equity, and inclusion is at the core of our mission. We believe that by embracing diversity, ensuring equity, and fostering inclusion, we can build strong and innovative teams that make a positive impact. Join us in our journey to empower all Atlassians to deliver their best work and contribute to a more inclusive tech industry.

Honeywell

Company Overview

Honeywell is a Fortune 500 technology company that delivers industry-specific solutions that include aerospace products and services; control technologies for buildings and industry; and performance materials globally. Our technologies help aircraft, buildings, manufacturing plants, supply chains, and workers become more connected to make our world smarter, safer, and more sustainable.

Our main corporate office is in North Ryde, Sydney and we have other offices in Brisbane, Perth, and Melbourne.

Connected through our common purpose of innovation and responsibility to ensure a more sustainable future, we are committed to protecting the environment, our people, and our communities where we live and work.

Workplace Diversity

Our mission in Pacific is to foster a performance culture that is built on the foundations of welcoming, including, respecting, understanding, and appreciating the different perspectives, backgrounds and experiences our people bring to the workplace everyday. Our leaders play a critical role and are at the forefront of our workplace culture. At Honeywell, we ensure that gender, race, background, sexual and gender identity or beliefs have no bearing on people's career potential – people are recognised purely for their contributions.

Honeywell is dedicated to nurturing your professional growth through a tailored technical learning framework. This includes face-to-face leadership workshops, leader-led webinars, and mentorship opportunities to enhance your capabilities. Our Buddy system ensures a smooth transition, while structured networking with Senior Leaders cultivates valuable connections. By setting annual goals and joining our global network of 15,000 engineers, you'll expand your impact within Honeywell's dynamic ecosystem.
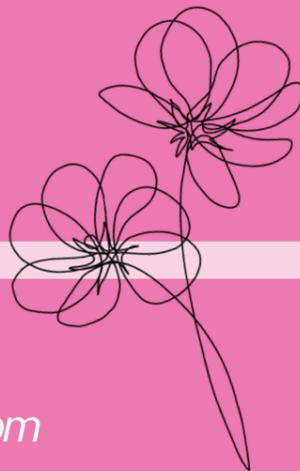
To learn more, visit https://careers.honeywell.com/honeywell-pacific

Blooming Through University:

Nurturing Your Academic and Social Journey

Importance of extracurricular involvement and leadership in engineering related committees

Amalia Nicopoulos,
Monash Engineering & Pharmaceutical
Science Society, Treasurer

Studying: Chemical Engineering
and Pharmaceutical Science, 3rd Year

By Elise Vayenas

Reflecting on your time within an Engineering Society Committee so far, how have you grown as a leader and personally?

I first joined MEPSS (Monash Engineering & Pharmaceutical Science Society) as a first-year rep and initially found the club a great way to make connections with older students to help guide us. Most of my first-year I just watched, observed and did what I was told. In the Treasurer role, as I have a lot more responsibility ensuring many decisions help events and the society to run smoothly, I needed to become more assured in my own decisions so that if a budget exists, it gets followed. Reflecting on my first year, I am now not only more proactive, ensuring follow ups are conducted from the first message to end-product, but also more confident in delegating tasks, rather than always being the one delegated to.

Are there any skills that you have developed in your role that you transfer into your daily life, course work or work?

Through societies and by doing engineering, you develop lots of soft skills and handle new situations a lot of the time. As you repeatedly use and hone these skills through your extracurriculars, it becomes easier to be confident about your work or classes. Attending placement was initially scary, but from MEPSS, I know how a team works and have that initial understanding of a team and its structure. You use the skills and experiences learnt from being in a leadership role to understand how your role fits in that team and appropriately apply that knowledge having seen similarities from our own club meetings to workplace weekly meetings.

How beneficial do you think involvement for some sort of leadership role is, particularly for students in Engineering?

My role has helped me in all aspects of my Engineering degree. You do a lot of group work in Engineering course work, but having a society sort of makes it easier as you are already aware of roles and how to collaborate effectively. You get to learn skills of communication, delegation and conflict resolution alongside people who are your friends, and apply the same concepts to your group work.

How do you ensure that you maintain a healthy life study balance throughout the year with a leadership role in an Engineering Committee?

Having a schedule to ensure you have times to do the things you really enjoy and things you need to get done. So, I spend a few hours per week on Treasurer and Committee related tasks and really set aside this time to get it done. I also have a great group of friends to catch up with and follow through with plans to really have that refreshed mind when I come back to studying or work.

Would you have done anything differently, or have any advice to students who are considering taking on extracurriculars?

Just do it. Join a team, that's something I am thinking of doing. Advice, I would say, even in first year, just try it and if you don't get in, apply again. Teams and clubs really do help you make friends and connections at uni. If you are in one team, you end up getting to meet so many great new people and expand your network even from other teams or clubs. These could be the people you work with in the future!

Tanushree Sharma: A Woman of Wonder

Tanushree Sharma,
Monash Young Med Tech Innovators (MYMI), Engagements Director
Project Dream Pod, *Validation Team Member*
Monash Cheer and Dance, *Hip Hop Team Member*

Studying: Biomedical Sciences and Materials Engineering, 4th Year

By Disha Kundra

Tell us a bit about yourself.

Hi, I'm Tanushree! I'm currently in my 4th year, diving into the worlds of Materials Engineering and Biomedical Science. Beyond the books and labs, I'm passionate about all things food, fashion, dance, and fun. For me, life is a nonstop series of adventures, and I'm here to Savor every flavour, style, rhythm, and thrill it has to offer!

What inspired you to be an engineer?

What inspired me to be an engineer is a combination of my long-standing love for medicine and physics. From a young age, I was fascinated by the intricacies of medicine and the logical challenges of physics. When I discovered that Monash offered a degree that combined these passions, I was instantly drawn to it. I appreciate how engineering cultivates a distinctive way of thinking that I apply daily. It shapes how I analyse life, whether in a classroom or at home, and influences the way I approach and solve problems.

This degree fulfils my ambition to help disadvantaged and neurodivergent individuals in Australia by providing tailored materials and engineering solutions to address their unique challenges.

What clubs and organizations are you currently involved with?

I've been actively involved in Monash Young MedTech Innovators (MYMI) for over two and a half years. Starting as a general representative and working my way up to Engagement Director, I've gained invaluable industry knowledge that often surpasses what is offered in university courses. Now I'm part of the Heart Hack team, contributing to the exciting development of an artificial heart. In my role, I focus on compliance, fittings and all things related to material assessment.

Also, I joined Monash Cheer and Dance last year (Moncad), which turned out to be one of the best decisions of my life. Not only did I meet some of my lifelong best friends, but I also had a blast traveling around Australia for competitions and representing my uni! Can't wait for many more fun experiences with this group! I highly encourage young women in STEM to join a student club whenever possible, as it offers a unique blend of practical knowledge and professional connections.

How do you balance your academic life with all this?

I believe that creating a strong network of friends and pursuing a hobby like dance is crucial for managing my studies. Dance helps me dissipate stress and provides a break from the rigorous academic demands of my degree. Being surrounded by like minded people who are willing to learn and grow creates a supportive environment that enhances my ability to balance academic and personal interests effectively. Navigating work-life balance has been an exciting journey, and I'm still figuring it out. As I finish my degree, I aim to master this balance with even more grace and poise, making the most of every moment.

Can you share one of your favourite experiences in your years at Monash?

I had an incredible experience as a coordinator of the Healthcare Innovation Summer Scholarship (HISS) program at Monash, which focused on the Stanford Bio design process of Identify, Invent, and Implement. This opportunity allowed me to take on a leadership role, guiding a group of outstanding and successful scholarship students. I also had the chance to connect with some amazing and inspiring individuals within the MedTech industry in Australia.

As a leader, I utilized my skills to educate and support the students while fulfilling various duties of a coordinator. This included administrative tasks, arranging masterclasses, and networking with industry professionals to create a well-structured program. I worked alongside two co-coordinators, and together we formed a strong team by leveraging each other's strengths and helping to improve each other's weaknesses. Leading this team was incredibly rewarding, as I helped these talented students find effective solutions to healthcare problems in Australia. Witnessing their growth and achievements along the way was truly inspiring.

How was your journey in achieving your achievements?

My journey in achieving my accomplishments has been incredibly rewarding. Being accepted into the HISS program in my first year at Monash empowered me greatly, opening my eyes to the realities of MedTech, including intellectual property, regulatory aspects, and funding. This exposure laid a strong foundation for my growth.

After HISS, I joined Monash Young MedTech Innovators (MYMI), where I developed leadership, communication, and research analysis skills. In 2022, I focused on building my professional persona and learning about research report creation. These skills helped me land the role of coordinator for the scholarship program I had previously been part of. Familiar with the program's structure, I made meaningful improvements by listening to student feedback and making the program more engaging and successful. I am grateful for the exposure MYMI and the opportunities Monash Institute of Medical Engineering have given me and I look forward to many more.

Femininity, Feminine Expression and Engineering: A Short Exposition

By Kayla Larbi

"Humble," "kind," "virtuous," "gentle." These are a few of the many characteristics associated with what the modern era defines as femininity. The roles assigned by femininity often impact a person's outward expression and the way they interact with the world, including their style, appearance and interactions in the workspace. The important thing to notice is femininity and its extrinsic expression vary between individuals and this is what makes generalisations and suppression of its expression inherently problematic.

Western socialisation preaches masculinity and femininity as two extremes, compared to ideas like the yinyang which preach complementarity not opposition. Masculinity is taught as dominant, while femininity is submissive, masculinity is rational where femininity is erratic.

This divide begins very young, where girlhood is perpetuated as being incompatible with STEM. It is asserted that girls are less scientifically oriented as boys based on the way the expression of these skills are observed. For example, a girl sewing clothes, an activity considered outwardly feminine would not be viewed as STEM aligning, despite the mathematical and technical aspects of the craft. And the divide doesn't stop there. We are socialised to believe that traits, activities and expressions typically associated with femininity are incompatible with STEM values.

And like most things, media and representation play a huge role in the perpetuation of this idea. Research reveals that the perception of STEM as a male associated field is partly driven by the representation of stem in media, with women making up 17.2% of computer scientists and 8.9% of engineers in films. [1]

Eva Flicker [2], upon analysing media from the years 1924 to 2004 places women in STEM in media into a few characters based on their perception. These included the "old maid", who is competent but unemotional and extrinsically unfeminine/unattractive, i.e Amy from the Big Bang Theory, "naïve expert", who is attractive yet gullible and subordinate to her male counterparts, rendering her incompetent, and the "lonely heroine" who is attractive and competent, but sexualised and unrecognised by male counterparts. These archetypes highlight the dichotomy of existing as a woman in technical fields – you can either be viewed as competent at the expense of feminine expression or express your femininity at the expense of your competency.

This plays out in many workplaces, where some female engineers and scientists report avoiding makeup and feminine clothing to be taken seriously, because drawing attention to their femininity inherently undermines their status as engineers. (Hewlett et all 2008) [3]. It is also one of the reasons for turning young girls from the field — the fear of having to abandon an aspect of their identity in the pursuit of technical skills.

As the years progress, we're expanding out of these restrictive categories, in reality and on screen. The notion of femininity and competency being mutually exclusive is becoming antiquated, seen in the rise of female scientists and engineers in popular media. These women, including Shuri (Black Panther 2018), Honey Lemon and Gogo Tomago (Big Hero 9, 2014), are respected for their intelligence and technical prowess while being feminine. And outside the screen, we're surrounded by many women and female aligning persons who prove this as well.

References

[1] D. Kool, N. H. Azevedo, and L. Avraamidou, "*The lonely heroine*: portrayal of women scientists in films," *Educational Media International*, pp. 1–22, Jul. 2022, doi: https://doi.org/10.1080/09523987.2022.2101205

[2] E. Flicker, "Between Brains and Breasts—Women Scientists in Fiction Film: On the Marginalization and Sexualization of Scientific Competence," *Public Understanding of Science*, vol. 12, no. 3, pp. 307–318, Jul. 2003, doi: https://doi.org/10.1177/0963662503123009

[3] Betz, Diana. (2013). Feminine Stem Role Models: Attempts to Improve Women's Motivation in Science, Technology, Engineering, and Mathematics Fields by Countering the Unfeminine-Stem Sterotype..

[4] S. Ramesh, "Owning My Femininity as an Engineer," Her Campus, Mar. 12, 2023. Available: https://www.hercampus.com/school/nanyang-tech/owning-my-femininity-as-an-engineer/. [Accessed: Jul. 28, 2024]

[5] K. Davies, "Best Films and TV to Inspire Women in STEM," Stem Women, Apr. 14, 2021. Available: https://www.stemwomen.com/best-films-and-tv-to-inspire-women-in-stem

[6] V. Gambhir, "Embracing femininity in STEM," Medium, Aug. 29, 2021. Available: https://medium.com/@vinigambhir3/embracing-femininity-in-stem-14df7e6726d3

[7] "Portray Her 2.0: An Analysis of 15 Years of Women in STEM On-Screen, 2007–2022," Geena Davis Institute. Available: https://geenadavisinstitute.org/research/portray-her-2-0-an-analysis-of-15-years-of-women-in-stem-on-screen-2007-2022/#:~:text=On%2Dscreen%2C%20men%20in%20STEM. [Accessed: Jul. 28, 2024]
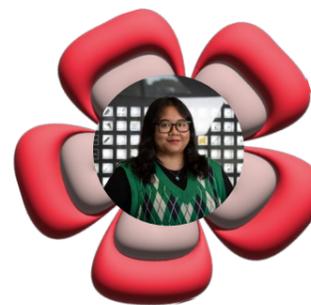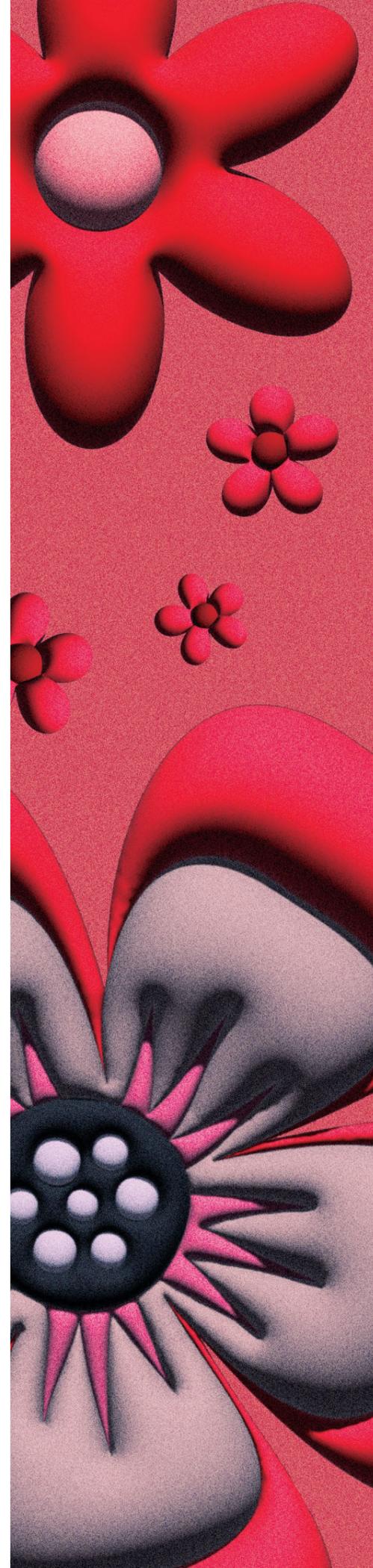
Ratu Esther-Kelvin
Bachelor of Science (Chemistry) and Bachelor of Materials Engineering (Honours)
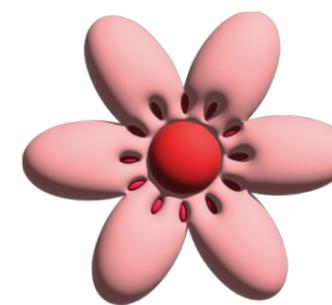
Suey Ho
Bachelor of Software Engineering (Honours)
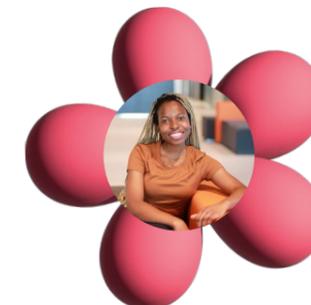
Mirabel Okoli
Bachelor of Civil Engineering (Honours) and Bachelor of Biomedical Science

Have you felt you've been able to portray your femininity in the engineering field? Has your expression of femininity affected you in any way (positive/negative)?

Ratu: There have been times where I've felt I've been able to portray my femininity in the engineering field, and there have definitely been times I have not. I feel most comfortable expressing myself as a woman, without the pressure to appear masculine, when I am in engineering environments that are more gender-balanced, and I am able to relate to more of the backgrounds, experiences, and perspectives of those around me. During times where I have been the only woman in a group project or class in engineering, I often felt less comfortable expressing any sort of femininity as a woman, as I might be treated differently by others, and not taken seriously in group work. Sometimes, I also felt that I was less likely to be heard in discussions.

Suey: Yes, I have felt able to portray my femininity in the engineering field as I feel my most feminine when I'm confident in my abilities.

Mirabel: As a woman in STEM, particularly in the field of engineering, I believe that each semester presents challenges and opportunities that allow me to portray my femininity. These challenges often involve working in a predominantly male environment where it is essential to set high standards to earn respect. Through collaboration, leadership, and maintaining my integrity, I am able to showcase the unique strengths and perspectives that femininity brings to the field

How do you think the media portrays women in STEM/engineering? Is there enough representation?

Ratu: The media is improving its portrayal of women in STEM, but there is still room for improvement, and this is also largely influenced by the political perspectives of the media outlet as well. Nowadays in the media, we do see women in STEM being praised for their achievements, and we do see more initiatives being done in schools to encourage girls to pursue STEM. That doesn't hide the fact however, that there are always comments from some media outlets that instil double-standards on women in the context of traditional gender roles, especially regarding family-making. Feminism isn't the enforcement of one lifestyle for women that is against traditional values, but the advocacy of freedom for women to live the lifestyle they want, regardless of whether it does lean to more traditional or progressive lifestyle choices. Thus, the media should direct the portrayal of women in STEM to neither shun a woman's focus on their career instead of stereotypical expectations of women in society (or vice versa), nor pressure women to balance everything all at once. Open-minded encouragement to the incredible potential and impact women have in STEM is key, so that girls grow up being able to envision themselves in STEM just as any other career path, from it being normalised.

Suey: The media portrayal of women in STEM has improved over the years, but sometimes the media representations can be stereotypes.

Mirabel: From a personal perspective, the media is making an intentional improvement in portraying women in STEM positively by highlighting and showcasing their effort, contributions and achievement in a couple of media platforms. Over the past few years, there has been notable improvement in the media representation of girls passionate about STEM. It is encouraging to see that not only the media but also industries are making intentional efforts to ensure better representation of women in fields traditionally dominated by men. However, more can be done to further this progress and this includes but not limited to continuous emphasis on showcasing diverse role models in the field of STEM, creating supportive mentorship programs, and promoting STEM education for young girls will help to inspire and sustain their interest in these fields. Increasing visibility and support for women in STEM is crucial for fostering a more inclusive and equitable environment.

Conclusion

By existing as Women in engineering, we disprove the notion of femininity and STEM being antithetical, whatever our feminine expression may look like. It is ours to discover, ours to own and ours to project.

# Insights from women in student organisations

By Clare Ahn
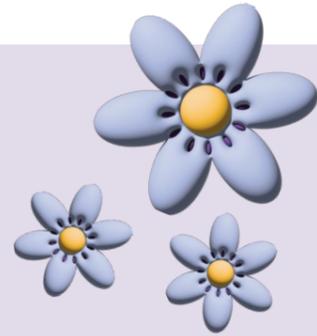
Annabel,
Bachelor of Eng/Comp Sci, 1st Year

What initially motivated you to join an engineering student organisation, and how has it influenced your academic and career path?

I was initially motivated to join an engineering club to build new connections and get involved with likeminded people that are taking the same course or similar classes. Since it is my first year of university, I was looking for a way to make new friends and talk to those who have already progressed through engineering to gain insights into different specialisations and expand my network of engineers that were beyond the common first-year subjects.. I'd say that by being in this club, I'm definitely more motivated to go to university every day and go to classes that I probably wouldn't have without others there with me. It has broadened my understanding of the many engineering specialisations beyond what has been said through Open Days & O-Week and has given me insight into what the classes are like and the opportunities within engineering. The club committee's experience in a lot of my current units has given me a lot of advice on how to do well in these units and taught me a lot outside of the allocated class. Overall, I'd say that being in an engineering club has positively influenced and given me a new appreciation of engineering.

Have you faced any instances where you had to prioritise your organisational commitments over your academics? How did you handle those situations?

I think I'm a lot more willing to forgo my academics - especially pre-reading- in order to attend events my club is hosting and this has at times led me to prioritising the club instead of my academic commitments. But every time I find myself leaning towards putting off my studies, I like to just put all the deadlines into a calendar and look at all my commitments from a broader perspective to see whether the time I have left is enough for extracurriculars or not. And with that, it's a lot easier to decide whether I have the time or not.
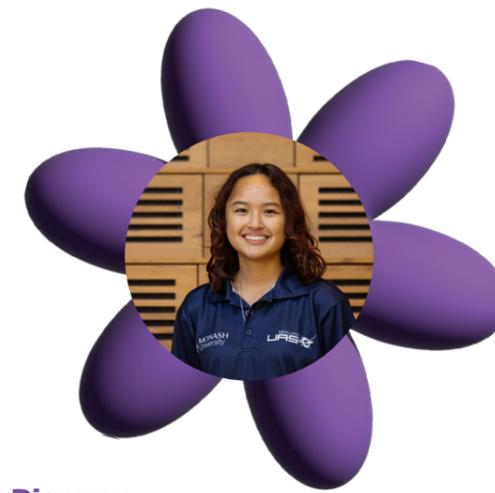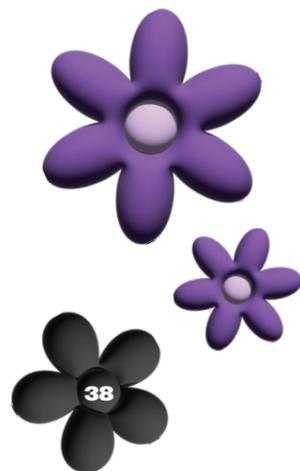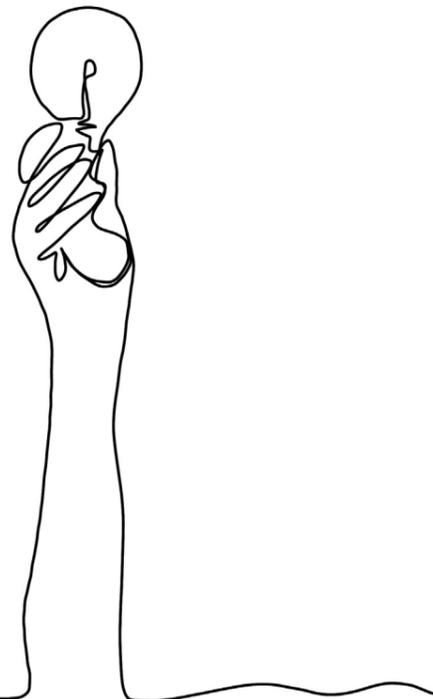
Diemmy,
Bachelor of Law/Eng (Honours);
Mechanical Engineering, 2nd Year

How has your involvement in the organisation contributed to your growth as a leader? Can you share specific skills or experiences that you have gained?

Upon joining Monash Uncrewed Aerial Systems (UAS), I was offered the role of Events and Programs Manager quite early on. One of my beliefs is that you should take every opportunity that may present itself. At the time, I was not knowledgeable in any capacity about the team, its logistics or the vision of our Events and Programs team. However, I was determined to leave the section better than I found it. Through this role, I learnt about the importance of interpersonal relationships, cooperation between team members and workload distribution. Through outreach programs with schools and promotional events, I have learnt how to engage people with engineering from all walks of life and the importance of increasing accessibility to engineering. The most important thing I have learnt as a leader is the ability to rely on your team members as the section can only be as good as the people that are in it. Hence, it is super important to not only trust your peers but to let them take initiative and have independence in their work.

What are some common misconceptions or stereotypes about women in engineering that you have encountered, and how does your organisation address and challenge these myths?

The most common misconception that I have noticed in women that do engineering is that you must be perfect. As a result of systematic and environmental factors, women in engineering seem to believe that they are not allowed to fail, not allowed to make mistakes or to be anything less than perfect. However, like our male counterparts, we should embrace failure and imperfection in the pursuit of bettering our skills, academics and technical ability. In our team, we try to encourage open discussion in which there is a comfortable environment to ask questions, move forward from failure and collaborate by combining each individual's skills. Not only are there a sizable number of women in UAS but there are women in management positions and contributing volumes to the advancement of our team.
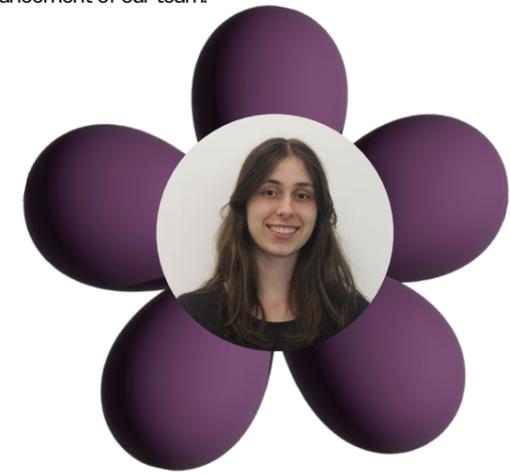
Elise,
Bachelor of Eng/Commerce;
Civil Engineering, 3rd Year

What has been the most rewarding experience of being part of a female-focused engineering student organisation, and how has it influenced your perspective on your future career?

The immense support that the community offers is undeniably invaluable. Even before joining WEM's committee, it was evident that WEM is deeply committed to its members, hence encourages and fosters connections between like-minded women through its industry and social events. Outreach programs highlight such involvement to student life even before university, whilst also creating and organising opportunities for members to to explore life as a graduate or senior manager. From working alongside committee members to attending events and activities, WEM has helped me to reinforce my confidence in finding my place in engineering.

What words of encouragement would you offer to female engineering students who are struggling with self-doubt or imposter syndrome?

It might be surprising but many of your peers feel the same way, each to their own degree! In 1st year, I avoided industry nights because I felt that I did not know enough about what engineering entailed. However, putting yourself out there and exploring and engaging in positions that challenge and inspire you, is a great way to keep learning and growing as a person. The connections you make with the people you meet joining clubs, teams or within your classes, and working with them on projects or a skill workshop together, might as previous doubts in a different light

Choose your player:
Biomedical or Electrical Engineering
An Engineer's Guide to MedTech careers

By Ashali Haputhanthri & Dheekshanya Thiruselvan Anuradhai

The MedTech industry is at the fascinating confluence of healthcare and technology, offering a career landscape brimming with innovation, growth, and impactful opportunities. Understanding the subtleties of each discipline can assist students to decide whether to pursue Biomedical Engineering (BME) or Electrical Engineering (EE). Let's delve into what distinguishes each route, hearing from:
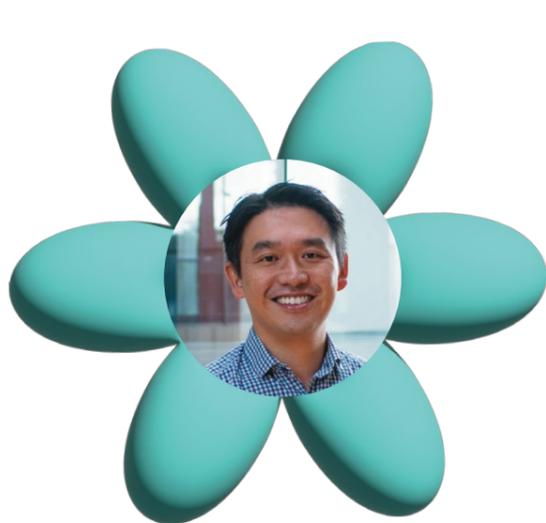
Associate Professor Yan Tat Wong
(Biomedical Engineering Course Director)

Mr. James Salamy
(Lecturer, Department of Electrical and Computer Systems Engineering)

Key Curriculum Differences

While there are some similarities between biomedical engineering and electrical engineering, the curriculum remains distinct and suited to their own specialities. A Biomedical Engineering course is often designed to bring together parts of medicine and engineering, with hand-picked sections that prepare students for jobs as biomedical engineers. This course gives a thorough grasp of medical devices and technology, but it may limit exposure to other engineering fields such as materials or chemical engineering unless taken as a double degree.

Electrical Engineering, on the other hand, covers a larger variety of topics, preparing students for careers in fields such as power engineering and telecommunications. For individuals pursuing a double degree, obtaining a Bachelor of Science can give access to multidisciplinary subjects and a well-rounded education. However, as Yan noted, "The industry doesn't prefer either, only prefers students that are good." Ultimately, the choice between a single or double degree hinges on individual career goals and interests.

Preparing for a MedTech Career and Developing Key Skills

Both biomedical and electrical engineering degrees prepare students for the MedTech sector, albeit in significantly different ways. Biomedical engineering is concerned with the integration of engineering concepts and biological sciences, with a particular emphasis on the creation of medical equipment and systems. Key units such as ECE4087: Medical Technology Innovation and MEC4404: Professional Practice emphasise the need of knowing clinical contexts and regulatory requirements. According to Yan, "Biomedical engineers need to complete these units in order to talk to clinicians and understand regulations" is very important.

Electrical Engineering, on the other hand, lays a strong foundation in electrical principles with applications extending to MedTech through the development of advanced medical imaging systems, wearable health monitors, and more. The rigorous technical training in EE ensures that students are well-prepared to contribute to technological advancements in healthcare.

But technical know-how isn't the whole story. Soft skills are equally vital. Engineering students often develop these through interdisciplinary courses and collaborations. "You need to communicate to the industry," as James put it, highlights the need for clear and effective communication skills. Engineering students must master the art of explaining complex technical concepts to non-engineers. Report writing, project management, and teamwork are integral parts of both curricula to prepare students for the collaborative nature of the MedTech industry.

Interdisciplinary Collaboration

MedTech breakthroughs rely on the seamless cooperation of biomedical and electrical engineers. Understanding the basic distinctions between professions and the ability to communicate across disciplines are essential abilities. As James aptly said, "Engineers do not think like physicians, mathematicians, etc. If you understand the fundamental difference between the professions, it is easier to collaborate in the real world."

Students from these areas frequently collaborate on research projects and in student organisations, creating a collaborative climate that reflects the professional world. Extracurricular activities, such as student teams and industrial collaborations, can help students improve their transdisciplinary abilities while also providing significant networking opportunities.

Evolving Roles in Medical Technology

Biomedical and Electrical Engineers' responsibilities are constantly evolving in response to MedTech's fast breakthroughs. Biomedical engineers are increasingly working on personalised medicine, wearable health technology, and new medical gadgets. Electrical engineers help by improving medical imaging systems, developing sophisticated diagnostic tools, and incorporating IoT technology into healthcare solutions.

The future of MedTech will likely witness a confluence of these fields, with engineers collaborating to solve complicated healthcare problems. Engineers in this dynamic sector must be able to learn continuously and adapt to new situations. "Learning is hard. You have to locate something of interest. One is work and the other is life, depending on where you want to go in life," says Yan, emphasising the need for a balanced and enthusiastic approach to life-long learning.

Advice for Aspiring Engineers

For students deciding between Biomedical and Electrical Engineering, reflecting on personal interests and career goals is crucial. Researching potential employers, networking with industry professionals, and gaining hands-on experience through internships and projects can provide valuable insights. "Look for job advertisements and network with other engineers. It's up to the student to be prepared with talking to the higher up," advises Yan.

Ultimately, success in the MedTech industry hinges on a combination of technical expertise, soft skills, and a proactive approach to career development. Whether pursuing a single or double degree, aspiring engineers should focus on building a strong foundation, engaging in interdisciplinary collaboration, and continuously seeking opportunities for growth.

10 Questions with Lizi

Elizabeth Sironic,
Senior Lecturer

By Lakshmi Palaniappan

Could you introduce yourself?

My name is (Dr) Elizabeth (Lizi) Sironic. I have been teaching part-time at Monash University for about 25 years. I am in the department of Civil Engineering. Most of my teaching has been in one of the general first year units and CIV2206, a second year Civil Engineering unit. My intent has always been to be approachable to students, to be there for them, that no question is a dumb question. I can come across as a bit bossy at times - because I care and really want to help students with their learning.

About ENG1011 and its students

What do you think about ENG1011?

I think it's a fabulous unit. It has a large hands-on physical built team project in it, and contains essential fundamental mechanical theory which is important to Civil, Mechanical and Materials Engineering. The physical build project greatly enhances students' understanding of theoretical concepts by turning abstract ideas into more tangible experiences. It also introduces students to working in teams, an essential skill as most Engineers work in teams.

As the chief examiner for this unit, do you have a lot of power to bring changes and introduce new things? If so, what changes have you made?

Tony (Vo) and I alternate the role of CE every semester. We are continually tweaking and changing things in the unit with the aim of improving it for students. Last semester, we went from two projects to one that ran for the entire semester. This reduced the student workload somewhat, but equally important also gave students more time to process and apply what they were learning. We also integrated some consolidation question activities

into the practical classes, recognising when students failed the unit (usually the final exam hurdle) it was usually because they failed in their understanding of the theoretical concept, and so we wanted to strengthen this aspect of the unit.

What soft skills do you think will be most important for current students?

Organisational skills – the ability to plan, prioritise and structure tasks, time and resources! Many students struggle when they first start university, not because they are not capable of doing the work, but because of the more flexible and more self-directed learning environment. Please get organised and read all your Moodle Announcement emails from staff!

What do you think about the growing use of AI by students?

Technology is moving very quickly with universities at times struggling to try and find their place within the AI world. The use of AI is a complex issue with both positive and negative aspects. While it can improve knowledge efficiency and enhance learning resources and assist in solving complex problems it can also reduce students' critical thinking and understanding of fundamental concepts (taught in ENG1011). An Engineer with a deep understanding of basic principles is, often at the start of a project, able to find quick ball-park solutions to complex problems without relying on complex computer analysis – something I don't think AI can do as well as humans.

What do you think are some mistakes students often make in their first years of university?

Not recognising that they need help and asking for it. I have lamented the loss of students coming to help desks to ask their questions, since COVID. That's probably partially because of students' busy lifestyles, however, I also think for some

reason students are embarrassed to directly ask for help. I find this sad as one of my favourite parts of teaching is sitting down, one-on-one, with a student and helping them. As a teacher, witnessing a student's "light bulb moment" when they grasp a concept you've explained is incredibly rewarding.

I also believe some students don't do as well at university as they can, because they often don't prioritise their studies over their social and work life. I understand the cost of living has forced many students to work (for money) more than they want to, but it's important when at university to prioritise your studies and learning — Failing a unit, is a financial as well as a time burden.

Do you see any possible solutions for these issues?

Please don't feel embarrassed and ask for help when you need it. Help is there and you just need to ask for it. Also slow down and smell the flowers. Enjoy your university life, you have many years of work ahead of you, so don't rush into it and try to do and have it all. If you really need to work (for money) consider maybe under-loading your studies and taking 3 or even 2 units in a semester.

Final Questions and Advice

What advice would you give to the first-year engineering students?

Just have fun, make lots of friends and study diligently! Don't hesitate to ask for help, be it personal or academic. Assistance doesn't have to come

from university staff; your peers can be a valuable resource and help to you also. In my day, me and my peers would work together in the library and support each other. Nowadays students seem to be more isolated in that respect. With such large cohorts now, some students go through the whole first year and don't really make many if any friends. University is a great place to build lifelong friendships; so put yourself out there and don't be afraid!

The final question: If there's one thing you could change about the university, what would it be and why?

Hmm... Get rid of paid parking on campus!! Maybe more students would then come to campus and attend all their classes in person! What a delight it would be to have a full lecture/Workshop. While online study options are convenient, it's crucial for students to come to campus to meet each other, network, socialise, collaborate and have fun.

Navigating Internships and Graduate Programs: Tips for Success

By Vicky Huang

If you're reading this, you may have acquired an internship or a position in a graduate program. Congratulations! Starting a new internship or a graduate program is always both exciting and daunting. It presents an opportunity to gain invaluable skills, experience and grow professionally. To make the most of this experience, here are some tips on navigating your new role!

Before Starting the Internship or Graduate Program

Before your first day, it may be worth investing time in researching the company you'll be working with. This will give you a chance to understand the company's mission, values, and culture which can provide a smooth start to your transition. Some key points to look out for include recent news involving the company, any major projects they are working on, and key players in the company. This will both boost your confidence and help you engage in meaningful conversations with your colleagues.

Have a think about what you would like to achieve through the program. This can help guide some of your actions and decisions to allow you to make the most out of your experience. Some areas you may want to focus on include the industry and professional skills you would like to develop, immersing yourself in the workplace culture, building your network and understanding your career interests.

During the Internship or Graduate Program

The key to a successful internship or graduate program is being able to achieve the goals you have set out for yourself, whether it is acquiring new skills or learning more about the industry. To help you achieve those goals, here are some tips and tricks!

Get to Know Your Team

Take the initiative to introduce yourself to your team and other colleagues - this will be the start of your working relationship with them. Ask them about themselves, the work they do and any advice they have! This will build a supportive work environment and make it a lot easier to ask for help later down the line. It also presents an opportunity to learn about the other roles within the company you may be interested in rotating into.

Address how people can sit blank on their first day. As in its not necessary that you ""know" how to solve the task. But then you should talk to peers, assigned mentor and do lots of research.

Ask Questions

Don't be afraid to ask questions, especially if you're working online and might find it challenging to initiate contact. Remember that you're new to the role and the more questions you ask, the more you'll learn. A helpful perspective is that those who ask more questions tend to go further in their careers. Your colleagues expect you to need guidance in the beginning so take advantage of their willingness to help.

Communicate

No matter where you go, you always hear the phrase "communication is key". This is because effective communication goes a long way. If you think you might have any difficulties in meeting a deadline or completing a task, let your supervisor or team members know as soon as possible. This transparency will help with managing expectations and your team will be able to provide the necessary support for your tasks.

Maintain a Work-Life Balance

Remember to take care of yourself! Maintaining a healthy work-life balance is essential, especially if you're working from home. Try to set clear boundaries between work hours and personal time to avoid burning out. Throughout the work day, make sure you take breaks and drink plenty of water.

As a final note, when you first start out, you may feel a bit blank or overwhelmed, especially when faced with new tasks or responsibilities. Remember, it's perfectly normal to not have all the answers right away. You will develop the skills and confidence to be able to tackle these tasks over time. I hope the tips in this article have been helpful and will make the process less daunting. I believe you will do well no matter what role you have found yourself in as long as you approach it with a positive attitude. I wish you luck in your future endeavours!
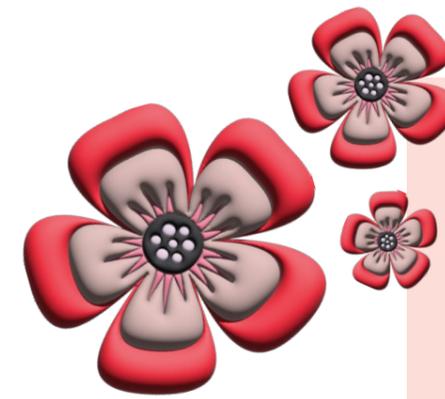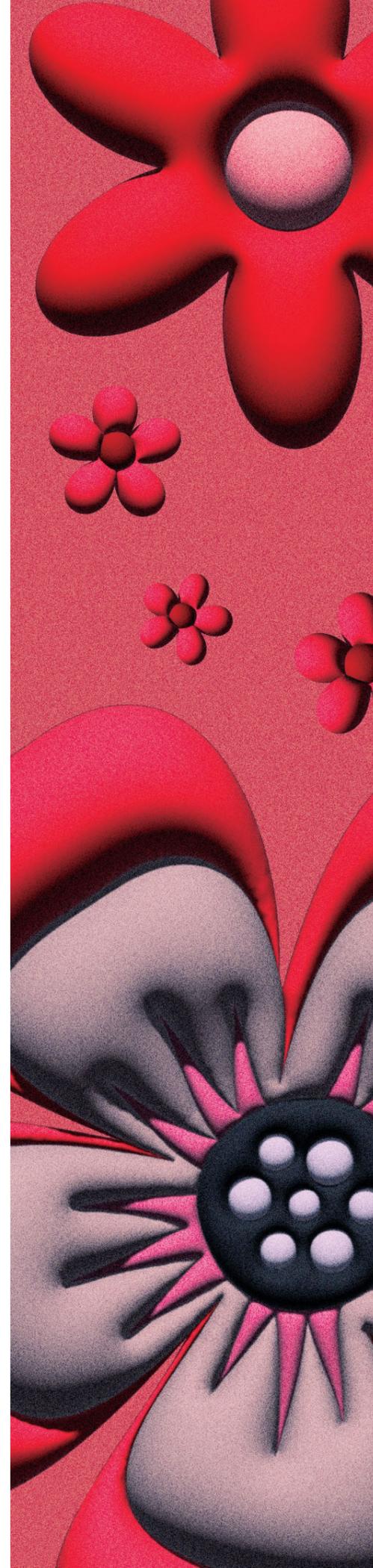
Uncertainty at Uni: Navigating Engineering as a Woman at Monash University

By Naree Khuon

Starting university is a significant milestone. It's exciting but also daunting because there are many choices to make. Everyone feels uncertain at first, no matter what they're studying. You have to figure out which courses to take, which clubs to join, and how to maintain contact with highschool friends. It's a time when you start contemplating what you want to do with your life, and that can be pretty overwhelming. For engineering students, this uncertainty can feel even more intense. Engineering courses are notoriously challenging and the workload is substantial. During the first year, you study the fundamentals like mathematics, physics, and introductory engineering concepts. Likewise, you have to decide which specialisation you want to pursue.

At Monash, there are many specialisations to choose from, including software, aerospace, civil, mechanical, materials, mechatronics, electrical and chemical engineering. Having many options is advantageous, but also complicates the decision-making process. You have to consider what you enjoy, what you're proficient at, and what kind of job you envision for yourself in the future.

For women in engineering, there are additional challenges. Engineering remains a male-dominated field, even though the gender gap is gradually improving. Sometimes, being one of the few women in a class can feel isolating. Monash University currently works to support women in engineering with organisations like our club. Our club creates a supportive community, offering mentorship, networking opportunities, and resources to tackle the unique challenges women face. Nevertheless, figuring out where you fit in the engineering world is a personal journey.

In the first year, as you learn about different engineering fields, it's normal to feel uncertain. Each specialisation has its own set of challenges and opportunities. For example, mechanical engineering covers designing and building machines, while chemical engineering focuses on processes and transformations at a molecular level. Choosing your path isn't just about what interests you academically but also considers your future career prospects and job opportunities.

To navigate this uncertainty, it's important to research different fields and talk to professors, peers, and professionals. You need to balance your interests with practical considerations about the engineering industry. Career paths are rarely straightforward; many students end up working in areas they didn't initially plan on. Getting involved in clubs and societies can also help ease some of this uncertainty. Joining groups like the Women in Engineering can provide a sense of community and support. These groups offer a chance to meet other students, participate in events, and find mentors who can help guide you through your academic journey.

Ultimately, dealing with uncertainty at university, especially as a woman in engineering, is about being resilient and flexible. It's about building a support network, leveraging university resources, and being courageous enough to explore different options. The uncertainty can be tough, but it also brings opportunities for growth. It's normal to feel unsure and to change your mind along the way. University is a time for exploration and discovering what truly interests you :)
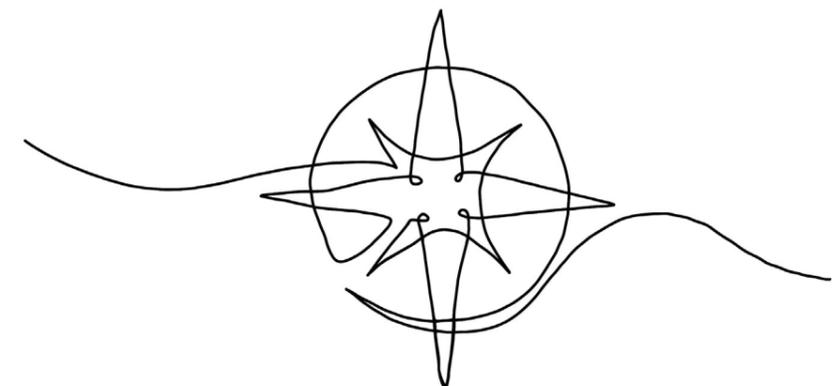
A Challenging Path: Barriers Women Engineering Students Face

By Yesha Tesoro
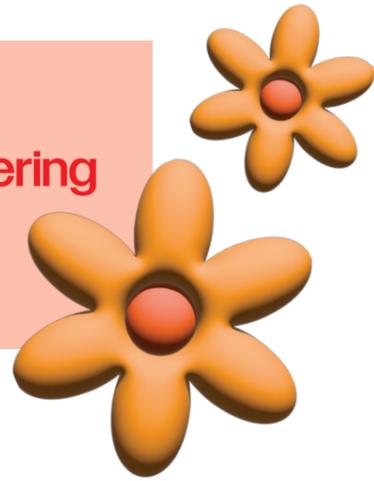
Though more and more females are entering the engineering industry, there are still many challenges that hold them back from reaching their fullest potential. Addressing these obstacles is an important step in enabling future female engineers to flourish and grow.

Engineering has been long known as a male-dominated profession, however in recent years there has been an increase in young women partaking in this degree and working in this field. Despite this, female engineering students still face many challenges that their male counterparts do not encounter, it was shown that out of the 48% of women working in Australia, only 13% are professional engineers [1]. These can range from facing gender disparities, lack of opportunities and role models to biases, greatly hindering their ability to succeed and thrive in this industry.

Gender stereotypes

One of the biggest hurdles in a woman's engineering degree and career is the persistence of gender stereotypes throughout their degree and even when they enter the field. Female engineering students are often judged based on stereotypes rather than technical abilities and skills. This can cause self-doubt and an underestimation of their capabilities, placing additional stress on these students as they now feel the need to constantly work hard to prove themselves to others. Furthermore, gender stereotypes shape the expectations of peers and educators. Women are often seen as "highly communal" [2] and

"less agentic" [2], leading to the assumption that they do not possess the qualities necessary to thrive in the engineering field. As a result, they are often overlooked in leadership positions within a group project and miss out on professional development and encouragement, causing a sense of exclusion and isolation. They are also more likely to be given tasks within group projects that are deemed as 'non-technical' such as making presentation slides or presenting rather than technical discussions.

These subtle biases not only take place within a woman's engineering degree but also carry on onto their professional life. All these experiences can greatly impact their sense of belonging within the engineering community, leading to high dropout rates or a decision to switch to another course, ultimately resulting in a lack of female representation in engineering making it difficult for female engineering students to envision themselves in successful engineering roles.

Lack of opportunities

Another challenge that female engineers face is the unequal opportunities presented to them. Studies that have been conducted show that women often face a "lack of familiarity with the profession" [3] and have "poor STEM engagement in schooling" [3]. This can hinder the progression of their degree and affect their career growth as well, it can be harder for female engineering students to secure internships which is important for setting up a solid professional foundation.

This lack of opportunities ultimately leads to an inadequate representation of women engineers which may discourage female engineering students from pursuing a career in this field. This also leads to a lack of mentors who can empathise with the experiences that female students go through, leading to feelings of isolation and a lack of a support network, making it much more challenging for women to pursue their degrees and advance their careers.

So, what can we do and how can we tackle this?

Joining initiatives and programs that aim to support female engineering students is one way to encourage women to continue pursuing their degrees despite being in a male-dominated field. These initiatives can help female engineering students connect to support networks, and provide advice and mentorships on how to ace university and prepare for the workforce. Some steps that can be taken to overcome these hurdles are trying to implement STEM programs for girls even before university to help them build up their confidence in their technical abilities and in themselves. Another step that can be taken is raising awareness about gender biases, albeit subtle, and promoting an inclusive culture within educational spaces.

However, it is also important to note that the engineering industry has been making significant progress when it comes to respecting women and their qualifications and technical abilities. By continuing these efforts and providing women the support they need in this field, the engineering industry can be grown into a more inclusive and supportive environment for future women engineers.

References

[1] M. McKinnon and C. O'Connell, "Perceptions of stereotypes applied to women who publicly communicate their STEM work," Humanities & social sciences communications, vol. 7, no. 1, Nov. 2020, doi: https://doi.org/10.1057/s41599-020-00654-0.

[2] T. O'Brien, "Women in engineering breaking the mould - Diversity Council," Diversity Council Australia, Jul. 20, 2023. https://www.dca.org.au/news/blog/women-in-engineering-breaking-the-mould#:~:text=The%20research%20identified%20several%20key,workplace%20culture%20and%20unequal%20opportunities. (accessed Jul. 24, 2024).

[3] consultanz, "Why Australia is struggling to get more women into engineering and construction," ConsultANZ Recruitment, Mar. 07, 2023. https://www.consultanz.com.au/women-in-engineering-construction/ (accessed Jul. 24, 2024).
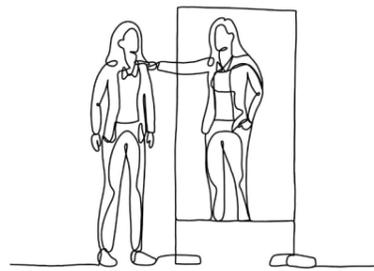
Imposter Syndrome faced by first year students

By Bhavya Pathak

Having recently completed my first year, I vividly recall the challenges and anxieties of being a first-year student in a demanding environment. Despite excelling academically in high school, my university experience was a stark contrast, filled with self-doubt and imposter syndrome. As someone who has navigated this journey, I want to share my insights on imposter syndrome among first-year students in STEM and engineering, along with strategies to overcome it.

Reasons for Imposter Syndrome

For first-year students, imposter syndrome can manifest in several ways:

1. **Self-Doubt:** Like many, I often felt less capable compared to my peers in university. In high school, I was used to being among the top students, but at university, I was just one among many smart individuals. This shift led to a diminished sense of self-worth and confidence.

2. **Perfectionism:** The pressure to achieve perfection became overwhelming. I felt that any mistake would reveal my inadequacies, which led to high levels of stress and anxiety.

3. **Overpreparation:** To avoid failure, I spent excessive amounts of time preparing for classes and exams. This overpreparation often resulted in burnout and negatively impaced my overall well-being.

4. **Fear of Failure:** A heightened fear of making mistakes prevented me from taking on challenging projects or seeking help when needed. This fear stifled my creativity and innovation, which are essential in STEM fields.

5. **Lack of Belonging:** In a male-dominated environment, I occasionally felt out of place or isolated, exacerbating feelings of not being good enough and questioning my decision to pursue a career in STEM.

Contributing Factors

Several factors contribute to the prevalence of imposter syndrome among first-year students, especially female, in STEM and engineering:

1. **Gender Stereotypes:** Persistent stereotypes that men are more suited for STEM fields can undermine the confidence of female students. These stereotypes can be internalised, leading to self-doubt and feelings of inadequacy. [1]

2. **Lack of Role Models:** The scarcity of female professors and professionals in STEM can make it harder for female students to envision their success. The absence of relatable role models can contribute to feelings of isolation and self-doubt. [2]

3. **Peer Comparison:** In competitive academic environments, constant comparison with peers can lead to feelings of inadequacy. Students may believe that others are more capable, which further fuels imposter syndrome. [3]

4. **Societal Expectations:** Societal pressures and expectations placed on women can add additional stress and self-doubt. Balancing academic demands with societal expectations can be particularly challenging. [4]

5. **Isolation:** Being one of the few women in a class or program can lead to feelings of isolation and increased self-doubt. The lack of a supportive community can exacerbate imposter syndrome. [5]

My Personal Experience

When I first started my engineering degree at Monash, I felt overwhelmed by the new environment. Accustomed to being among the top students in high school, but at university, I was now surrounded by equally or more talented peers. Some seemed to grasp course content effortlessly, while I had to put in substantial effort to keep up. This perceived disparity in ability led to significant anxiety, which impacted my performance in tests.

During the initial weeks of my first semester, I constantly questioned my capabilities. Every lecture and practical session seemed like a test of my intelligence. I remember spending countless hours in the library, meticulously going over lecture notes and textbooks, trying to ensure that I understood every concept perfectly. Despite this effort, I still felt behind, especially when I saw classmates who appeared to grasp the material effortlessly.

The anxiety I felt wasn't just limited to academics; It seeped into my social interactions as well. I hesitated to ask questions in class or seek help from professors, fearing that I would be seen as less competent. Group projects were particularly stressful, as I worried that my contributions wouldn't measure up to those of my peers. This led to a vicious cycle of overpreparation and burnout, which only intensified my feelings of inadequacy.

It took me the entire first semester to realise that I didn't have to feel this way. One pivotal moment was when I received feedback on a major assignment. Despite my fears, the feedback was positive and highlighted my strengths. This helped me see that my efforts were indeed paying off, even if I couldn't see it at the moment.

By the end of the first semester, I began to adopt a more balanced approach. I learned to set realistic goals and to give myself credit for my achievements, no matter how small they seemed. I also started to reach out for help more often, realising that asking questions was a sign of strength, not weakness. This shift in mindset allowed me to manage my anxiety better and improve my academic performance.

Strategies to Address Imposter Syndrome

To help first-year students overcome imposter syndrome, institutions can implement several strategies:

1. **Support Groups:** Establishing support groups where students can share their experiences and strategies for overcoming imposter syndrome can foster a sense of community and belonging. Peer support can be invaluable in combating feelings of isolation.
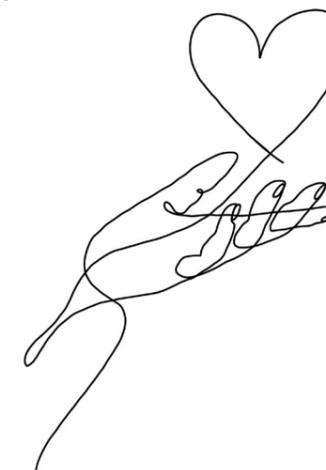
2. **Positive Reinforcement:** Encouraging faculty and peers to provide positive feedback and recognition of students' achievements can boost confidence. Celebrating successes, no matter how small, can help counteract negative self-perceptions.

3. **Role Models and Speakers:** Inviting successful female engineers and scientists to speak and interact with students can inspire and motivate. Hearing stories of overcoming challenges offersvaluable perspective and encouragement.

4. **Academic Support:** Offering tutoring and academic resources can help students feel more confident in their abilities. Knowing that support is available can alleviate anxiety and reinforce a growth mindset. [6]

5. **Promoting Inclusivity:** Fostering an inclusive environment where diversity is celebrated and all students feel valued is crucial. Encouraging collaboration and respect for different perspectives can enhances the learning experience for everyone. [7]

Imposter syndrome is a significant challenge for first-year female students in STEM and engineering, but it is not insurmountable. Overcoming imposter syndrome requires not only individual resilience but also a culture that values and supports diversity, inclusion, and belonging. With the right support and mindset, first-year students can navigate these challenges and thrive in their academic and professional pursuits.

References

[1] sexgenlab, "Imposter Syndrome and Women of Color: How race and gender stereotypes impact high achieving women," *MySite*, Apr. 25, 2019. Available: https://www.sexgenlab.org/post/research-blog-some-stereotypes-die-hard-gender-race-and-the-imposter-syndrome

[2] "Understanding Imposter Syndrome in the Workplace," *www.wellics. com*. Available: https://www.wellics.com/blog/understanding-imposter-syndrome-in-the-workplace

[3] "Compare carefully to manage your inner imposter," *www.ukri.org*, Apr. 10, 2024. Available: https://www.ukri.org/blog/compare-carefully-to-manage-your-inner-imposter/#:~:text=Comparing%20yourself%20to%20others%20can [Accessed: Jul. 26, 2024]

[4] "Unmasking Imposter Syndrome: A Journey To Self-Belief - Samuel Centre For Social Connectedness — Samuel Centre For Social Connectedness," *www.socialconnectedness.org*. Available: https://www.socialconnectedness.org/unmasking-imposter-syndrome-a-journey-to-self-belief/

[5] J. Mason, "The isolation of Imposter Syndrome: A conversation," *The Oxford Blue*, Nov. 03, 2022. Available: https://theoxfordblue.co.uk/the-isolation-of-imposter-syndrome/ [Accessed: Jul. 26, 2024]

[6] "How the imposter syndrome can affect students and how you can avoid it," *The University of Sydney*. Available: https://www.sydney.edu.au/study/student-life/student-news/2021/09/28/imposter-syndrome-and-how-to-overcome-it.html

[7] mildon-admin, "Tackling Imposter Syndrome Through Diversity and Inclusion," *Mildon*, Nov. 22, 2021. Available: https://www.mildon.co.uk/podcasts/tackling-imposter-syndrome-through-diversity-and-inclusion/ [Accessed: Jul. 26, 2024]
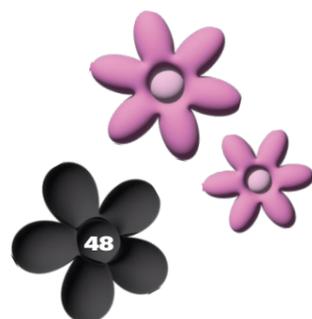
Transition from First Year to Second Year

By Charlotte Evans

There exist many anecdotes, stories, and much advice about the transition from secondary school to university. However what garners far less coverage is the transition from first year to second year, which is of particular relevance to Engineering students.

Second Year Engineering differs from First Year in several significant ways. Much of the support available during the first year—such as the First Year Helpdesk, PASS Sessions, and First Year Revision Sessions—disappears. In fact, your peers are now taking on these roles as PASS leaders, Teaching Assistants, and members or leaders of various Student Clubs and Engineering Teams. More importantly though, Monash Engineering is structured such that Second Year is when students progress into their chosen Engineering specialisation. But for me, Second Year Engineering at Monash felt less like a progression and more like a process of picking up the rubble left behind from First Year...

The Beginning

I commenced studying my Bachelor of Engineering/Commerce at Monash in 2022. I hadn't taken VCE Specialist Maths or Physics at school, so I had to take foundation units for both of these in my first semester. What could possibly go wrong with cramming two years worth of Maths and Physics into 12 weeks? In the end, I took four units: Foundation Maths, Foundation Physics, an Accounting unit, and ENG1013; a first year Engineering Unit with a heavy emphasis on Electronics (a topic of which I had no prior knowledge) because I thought it would be fun. The result? I discovered that the GPA scale actually goes below 1, made possible because I failed ENG1013 and barely passed the others. Shortly after, I also learned that you can fail a supplementary exam, and I would have to repeat ENG1013 again!?

This setback had the domino effect that, while my friends were swiftly moving on to their Second Year subjects in their chosen specialisations, I was still catching up on leftover first-year Engineering units and repeating ENG1013.

Choosing an Engineering Specialisation

I spent much time deliberating on which engineering major I would pick if or when I would ever finish the endless stream of first year Engineering subjects. For those who had been coding since they were 12, mastered electronics in VCE Systems Engineering, or were following in the footsteps of an Engineer parent, this was a no-brainer. But for someone like me — more of a jack of all trades, master of none, with a vague mix of interests from each discipline it's a lot harder. You're telling me there's no such thing as a civimechatronisoftwerial engineering degree!?

So, I decided to approach the problem via a process of elimination. The first to go were Aerospace and Mechanical Engineering, because they had too much maths and physics. Having done three engineering units up to this point that contained Physics, I accepted I didn't have much intuition for it. I could understand the physics of things moving in a straight line, but once things started moving in two dimensions, three dimensions, or, god forbid, in a circle, I was clueless. In terms of what majors were left, I was too squeamish for Biomedical, not interested in Environmental, bored by Materials, and refused to be fooled by the deceptively-named Chemical Engineering, which was also physics-heavy. Mechatronics and Electrical Engineering were obviously not options given my performance in ENG1013.

Then there were two: Civil Engineering and Software Engineering, probably the most opposite disciplines in the Engineering Faculty. Civil appealed to me because I liked maps, cities and buildings, Software interested me because I liked computers and technology.

In the end, I tentatively settled on Software Engineering, with Civil Engineering as my backup if it didn't work out.

Another Rocky Start

Finally, by Semester 2 of my Second Year, all my First-Year Engineering units were completed and I could begin my Software Major. The first unit most Software Engineering students take is FIT2085 — Introduction to Computer Science.

It went as follows:

Week 1: *A bit harder than expected, but I'll see what happens.*

Week 2: *The first assignment has been released — it looks very complicated...panic ensues.*

Week 3: *Many late nights are spent stumbling through the assignment.*

Week 4: *I submitted my god-awful assignment.*

By the end of Week 5, the results were released, and unsurprisingly I failed by a lot. Had I taken this unit a semester earlier, this assignment would've been a hurdle, meaning failing it equaled an instant fail for the unit.

Despite avoiding this immediate fail, I really doubted my ability for Software, and seriously considered dropping out of the major, or dropping Engineering altogether. The sunk cost fallacy convinced me to stick with my Engineering degree, otherwise all the blood, sweat and tears of the last 18 months would have been for nothing.

With regards to Software Engineering specifically, I distinctly remember what a Teaching Assistant told me when I expressed frustration with the difficulty of the subject. They explained that FIT2085 is designed to be difficult, acting as a filter to keep out those who don't really have the ability for Computer Science. I refused to be filtered out, after all, I had still had two more assignments by which I could redeem myself.

So I gave myself an ultimatum: to try my hardest and give Software my best shot that semester. If I failed then I could switch to Civil Engineering and be at peace with the decision because at least I gave Software a fair try .

Today

I never ended up switching out of my major.

I'm currently approaching the end of my third year of Software Engineering, where I have been living in blissful ignorance of torque, magnetic flux, vectors and the like.

I'd like to conclude by saying that...It's okay if you don't know, and it's okay if you're slow. In fact, at the time of writing, I still have a first-year Commerce unit left! My degree is going to take me six years, and I don't know what comes next but at least now I have the confidence to tackle any challenges that come my way.

Flourishing in the Field:
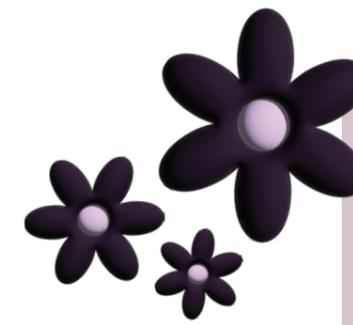
Industry Insights and Opportunities

From Landing your First Job to Excelling in your Career

By Yokabit Fesshaye

Women Empowerment within the Industry

With the help of the evolving digital world, the availability of professional opportunities has become endless. Networking has become a vital trend in recent science, technology and engineering sectors especially for women to harness their social skills and develop relationships to benefit their careers [1]. Over the years, online networking has proven to remove social barriers that may prevent women from securing jobs [1] as well as provide a platform to connect women from all over the world in all kinds of industries. These connections act as a gateway to learning opportunities, receiving advice from others, mentoring opportunities and it is through these connections, that women can empower and guide one another into pursuing their dream careers. Having access to social platforms such as LinkedIn provide vast opportunities to take your career to the next level with the help of global outreach. Through these platforms you can invest in network sponsor programs, connecting with high status networks around the world, to not only extend your environment, but also enable you to overcome the many challenges women face in all industries [2].

Endless Opportunities

Aside from networking, there are many benefits from participating in workshops, events and other programs designed to enhance your intrapersonal and professional skills. Many of these events and programs can be discovered through social platforms. With an increase in social media use for employability reasons, a lot of events are conducted online. This removes many barriers, such as location and time, that people may face when it comes to getting involved and connecting with their respective industries. Many universities also believe that attending programs such as career workshops or even events teaching you how to approach professionals, increase your chances at professional development [3]. Because of the endless advantages, universities encourage professional development practice and professional social networking inside and outside of the classroom (faculty clubs, social clubs, university teams) with the goal of strengthening industry connections as it will improve the employability of students and graduates [3].

Final Notes

It is never too late or too early to be looking out for opportunities that can support your academics as well as your career. Developing those relationships within the industry could be the missing connecting piece between you and your dream job. Attending a careers workshop and getting your resume reviewed by someone in the industry can also help guide you to the next stage in your life. From personal experience, rejections can be extremely daunting but they are nothing more than a learning opportunity to improve yourself and make changes to your approach to the industry.

Building a reputable professional social presence is very important as many researchers have found that almost 50% of recruiters utilise those platforms to gain information about job applicants [3]. So, the more you put yourself out there and the more you get involved in all these small things that help build your professional mannerism, the more likely you are to lead a successful career.

References

[1] H. Donelan, C. Herman, K. Kear, and G. Kirkup, "Patterns of online networking for women's career development," Gender in Management, vol. 24, no. 2, pp. 92-111, 13, Mar, 2009. [Online]. Available: https://www.emerald.com/insight/content/doi/10.1108/17542410910938790/full/html. [Accessed July 26, 2024]

[2] C. Rua-Gomez, G. Carnabuci and M. Goossen, "Research: How Women Can Build High-Status Networks," Harvard Business Review, 20, Mar, 2024. [Online]. Available: https://hbr.org/2024/03/research-how-women-can-build-high-status-networks. [Accessed July 26, 2024]

[3] E. Badoer, Y. Hollings and A. Chester "Professional networking for undergraduate students: a scaffolded approach," Journal of Further and Higher Education, vol. 45, no.2, pp. 197-210, March 2020. [Abstract]. Available: Taylor & Francis Online, https://www.tandfonline.com. [Accessed July 26, 2024]

A Rising Star:
Geintanksha Tandon

Geintanksha Tandon,
Hardware Engineer at NVIDIA

By Vanshika Gupta

Can you start by introducing yourself and telling us a bit about your hobbies?

My name is Geintanksha Tandon. I recently graduated from the University of Illinois, and I am currently working as a hardware engineer at NVIDIA. In my free time, I enjoy reading, listening to music, and playing badminton. I completed my high school in Dubai and then pursued further studies in the States.

What are you currently working on or what projects are you involved in?

I decided to go into hardware engineering in 2022. Over the summer of 2023, I worked with Microsoft on their Lattice Chips. After that, I did an internship with NVIDIA in the fall, and I chose to work there full-time post-graduation. Currently, I am working on GPU design verifications.

What made you choose your current career path?

In high school, I initially wanted to pursue literature and journalism. However, living in Dubai made it difficult to pursue this career path since I wasn't in my home country and I wasn't familiar with the local political sphere either. I had been away from India for the past decade. I saw that I was good at computer science and enjoyed the intuitive thinking involved in coding. I continued with computer science in 11th and 12th grade, and after graduation, I realised how much I liked it.

Computer science is very competitive globally. Given my passion for physics, I considered majoring in computer science with a minor in physics or pursuing computer engineering to broaden my career options. I applied to UIUC for computer engineering and was fortunate to be accepted.

I initially thought I would take on a software engineering role and did an internship in my second year. However, I found that I wasn't very fond of frontend engineering. This experience made me realise that maybe software engineering wasn't for me. Thankfully, my computer engineering background included skills in digital design, and I became interested in how chips worked. Through research, I discovered my passion for hardware, where you write the logic for chips used in mobile phones and laptops. I then tailored my university courses to align with this interest and sought internships in the field, which was quite niche at the time.

Why do you think internships are beneficial?

Internships are a great way to get comfortable working on projects larger than yourself or a small group. They help you understand how to navigate a professional environment and collaborate effectively. You learn how to present your work to managers and higher-ups, making your contributions understandable and easy to absorb. On a personal level, internships boost your confidence as you see your work successfully applied in the industry. They also help you build a network and further develop your confidence.

### Have you ever noticed or faced bias as a woman in your field?

Early on in college, I did face some bias. In my cohort, only 13% of the engineering students were women. At Microsoft, I was the only woman in a team of 11, and the gender ratio at my office wasn't much better. It can be intimidating, and it's challenging to expand your friend network. There's an unintentional bias that women may not be as capable, and during group projects, if you become passive, people might speak over you or dismiss your opinions. It's something every woman faces at some point. You need to be mentally strong to stand your ground. It might be difficult, but you have to have internal confidence and know your abilities.

When I got great opportunities, I always had some people say that "it must be a part of the women quota". It's not something that they may have meant at that moment, but you don't say it unless somewhere down the corner you believe in it right? A big part is absorbing when people say this. But you have to remember that you don't have to prove anything to them. The only way to prove to yourself, is by doing better. By doing a little more than the rest. It's unfair, but at the end of the day the only person that matters is you. If you do more than what they expect you to do, you don't doubt yourself. And you can use this as a driving force. It's unfortunate that women have to do it to this day. But it's good to take it as a "you thought I couldn't do it," but "I did it better than you thought I could." At the end of the day it's not about proving anything to anybody else, just you for yourself. This helps build character more than anything else. Address the bias as a motivation to empower yourself, not something that holds you back. Remember that you belong in your role because of the work you've done.

What advice would you give to a woman entering the field of engineering?

Your only competition is yourself. Focus on being better than you were before. Build relationships that help you and the other person grow. Have a growth mindset. If you're working on a project where your contributions aren't being heard, focus on what you can do to make a positive impact. Put in the effort, and compare yourself only to yourself. College is also obviously a place where people are pitted against each other. A grade, an award or a degree. But be happy for others' achievements and know that your accomplishments are based on your own merit too. As long as you know that, it's good enough.
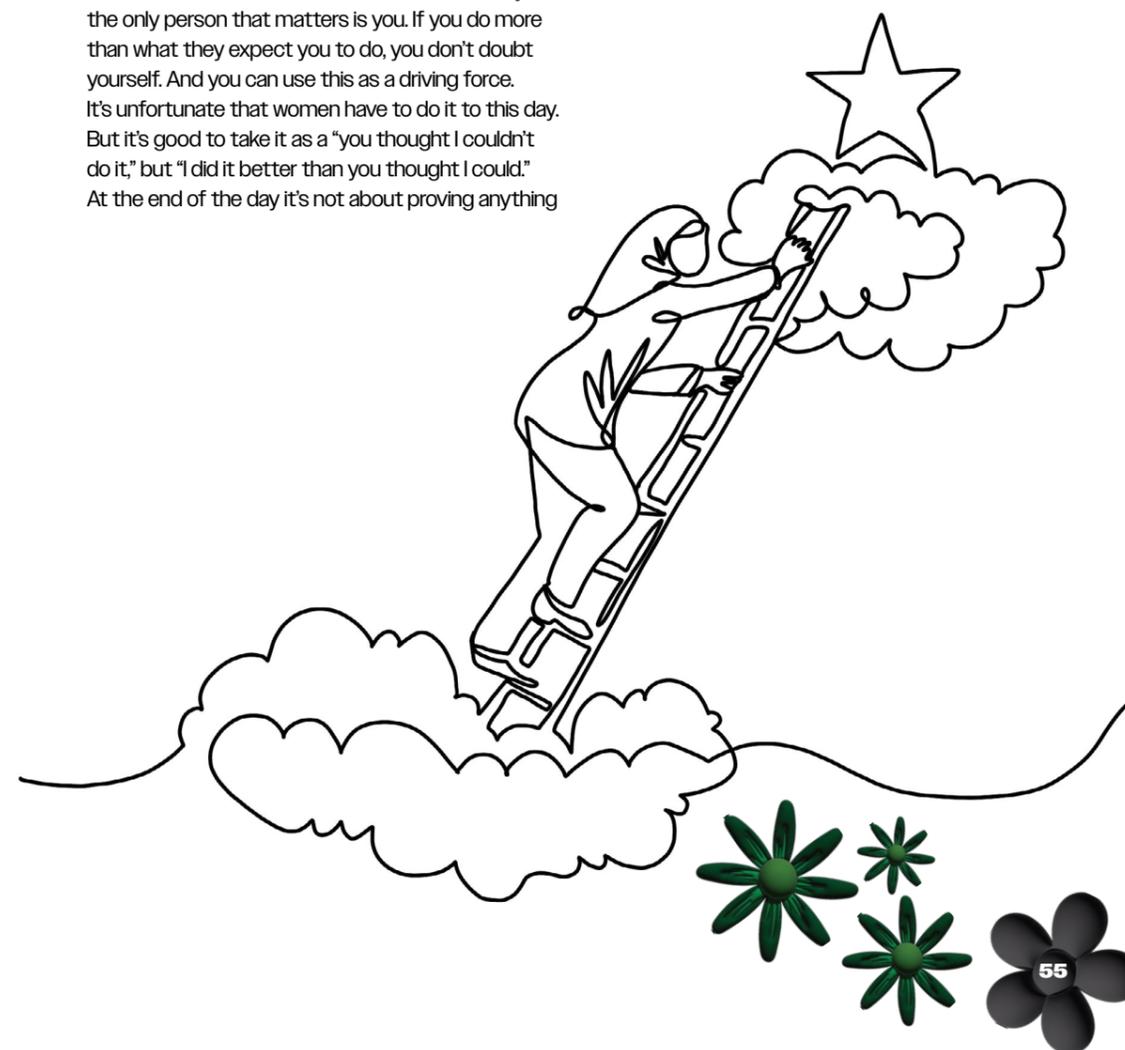
Life as an Experienced Engineer: Insights and Reflections

Becky Siriweera,
Mechanical Engineer
Australian Synchrotron ANSTO

By Ashali Hapunthanthri

What initially inspired you to pursue a career in engineering?

Bottom line it was my innate curiosity in the way everything works that drove me to engineering. When I was a kid, I would often take apart anything that had parts and try to reassemble them — even if they didn't always work perfectly afterward, it is a learning process after all. And with a passion for maths and science, pursuing a career in engineering felt like a natural choice. I really like the way engineering allows us to solve problems with both practical and creative solutions.

### What was your career journey to becoming an engineer like?

My career journey wasn't extremely difficult, but it certainly wasn't easy either. It required perseverance, motivation, and continuous learning and improvement. My time at Monash was particularly rewarding, I gained both theoretical knowledge and practical experience through involvement with student teams and design units. Internships further enhanced my professional learning, honing my practical skills and problem-solving abilities. As an engineer now, I can say that all the challenges and developments have been worthwhile, and I am still learning each day.

What were some of the projects that you have worked on? Was there a project that you found challenging? If so, how did you make your way through it?

Many of the projects I've worked on involve beamline equipment. One particularly challenging project was the "X-ray Beam Positioning Monitor" in the storage ring, which non-intrusively detects the beam's position through the photoemission effect. This project had a steep learning curve due to the extensive background knowledge required and the various systems involved in the design. Research and hands-on experience were essential, as well as seeking help and discussing the project with different people to gain diverse perspectives.

What were some of the skills and knowledge you have gained throughout your professional career?

Throughout my professional career, I have developed several important skills and gained valuable knowledge. My problem-solving abilities have become more efficient, helping me address challenges more effectively. I have worked on improving my technical proficiency, enhancing my design skills, and learning various techniques to verify the designs. Additionally, I have focused on building my project management capabilities, such as scheduling, prioritising tasks, and accurately estimating project requirements. These skills have been instrumental in my growth as a professional and have helped me navigate complex engineering environments.
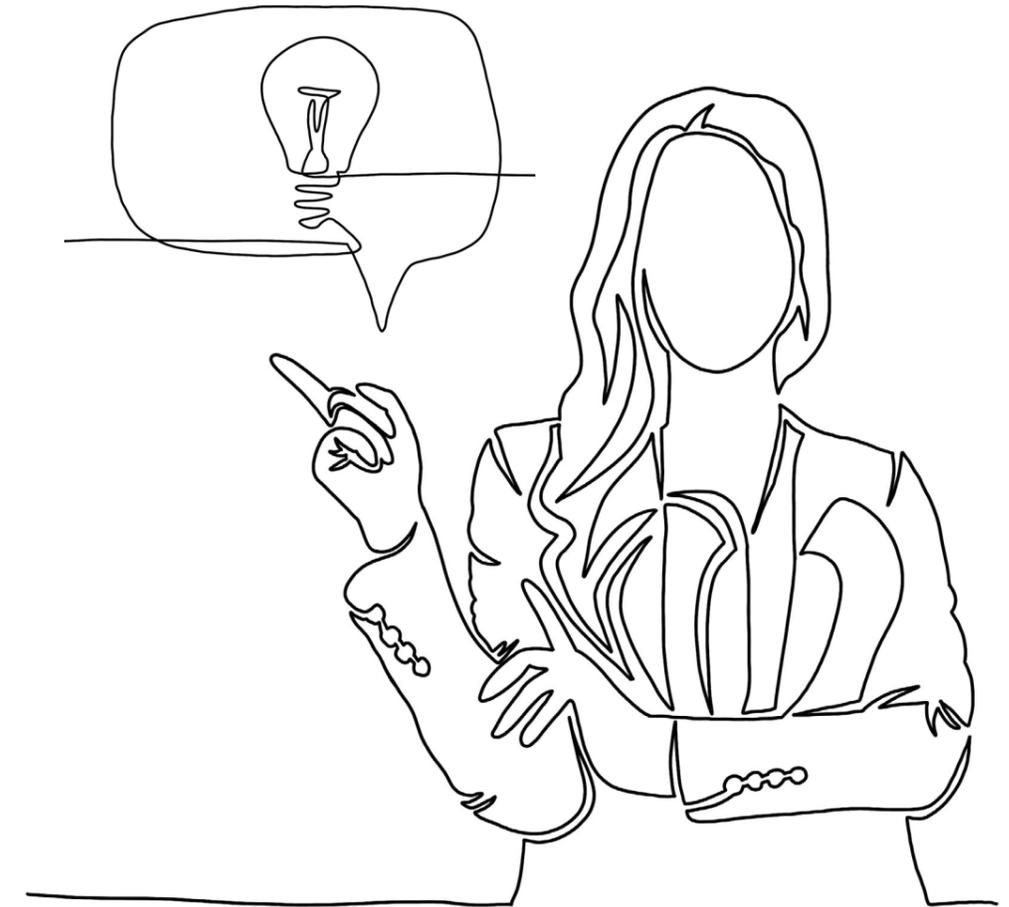
How were you able to stay updated on the loop with the latest developments in the engineering field and technology?

To stay updated with the latest developments in engineering and technology, it's important to be actively engaged. I've been fortunate to attend industry conferences, which provide valuable insights into emerging trends and innovations. These events also offer opportunities to collaborate with peers and experts, facilitating knowledge exchange and keeping me informed about current advancements. Additionally, I follow leading companies and engineering channels to stay current with new technologies and industry news.

Were you able to manage a work-life balance, especially throughout your challenging or time-demanding projects? If yes, how did you accomplish your balance?

Initially, it required a shift to establish a routine. I prioritised my time effectively, set clear boundaries between work and personal life, and didn't hesitate to ask for help when needed. Additionally, I made sure to take time to rest and refresh, understanding the importance of recharging to maintain productivity and well-being.

I believe that one of the most important values in becoming an engineer is ensuring that your work is ethical and professional. How did you ensure that your work was aligned with the ethical standards in the workplace?

I prioritise safety by designing systems that comply with relevant guidelines and regulations, ensuring the protection of users and the surrounding environment. I maintain transparency through essential documentation and clear communication, which builds trust and accountability. Additionally, I seek second opinions to identify potential ethical concerns and provide diverse perspectives, ensuring the work is scrutinised from multiple angles to uphold integrity and objectivity.

What are your long-term professional goals?

My long-term goals are to continually enhance my technical expertise, enabling me to mentor, share knowledge, and educate young professionals. I aim to provide them with the opportunities I received and more. Ultimately, I aspire to make meaningful contributions to the engineering industry, my company, and those around me.

Interview with WEM Alumnus
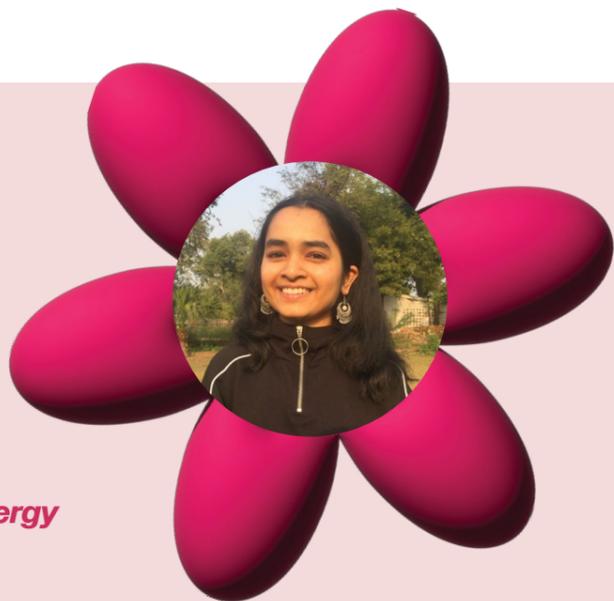
Manika Goyal,
Cloud Engineer at Origin Energy

By Joy Jasmine Kaur

Manika graduated with a Bachelor's in Software Engineering from Monash University in 2022. Currently, she works as a Cloud Engineer at Origin Energy. During her time at university she was part of WEM as well as Monash Nova Rover. She interned at an engineering consultancy, WSP, as a Software Engineer as a part of the Industry Based Learning (IBL) program.

How did your time at WEM and Monash Nova Rover help you in your career?

When I first joined WEM (then known as FEM), I was quite shy. I started as an Academic Events Officer and was hesitant to talk to the President and Secretary. However, they were super supportive and helped me build my confidence. I loved my time at WEM and I can say it's one of the best things that has happened to me. I had learnt a lot at WEM and was moving to Nova Rover, I was again nervous. I didn't want to leave WEM. But then, the President at that time encouraged me to value myself and not be fixated on one thing. WEM equipped me with essential soft skills and the confidence to approach professional people and Nova Rover enhanced my technical abilities.

What would you like to say to people starting their first internships or grad roles soon?

Don't hesitate to approach the managers and ask a lot of questions. Even if you are a little hesitant when you start at a new place, it's the right thing to do. It is natural to feel a bit uncomfortable when starting somewhere new. I was a little uncomfortable initially at Origin as I didn't have prior experience with AWS and the work was different to what I had done before. I was missing uni life at the same time. But, making friends helped me a lot.

Finding internships and jobs and actually doing them seems daunting at first. It gets better as you get familiar with the environment and build connections.

What do you say about nervousness for applying to internships and jobs?

At FEM, we found that women are hesitant to apply for internships and jobs if they don't meet almost 100% of the criteria. Most companies don't expect to hire someone who knows everything about every topic. When interviewing, they are looking for someone who is willing to learn. So, just do it! Apply to jobs even if you don't meet all criteria. What's the worst thing that can happen? You won't get in — which you still wouldn't if you don't apply. Even if you believe the chances of you getting selected are low, just treat the process as a practice round because then you would know how things work and what you need to prepare for the future. Also, a lot of companies keep a record of people applying to them. So even if you don't get in, you might hear back from them for a different opportunity.

Any tips for students looking for industry relevant experience?

I would highly encourage everyone doing software engineering to apply for the Industry Based Learning (IBL) program because it gives you an opportunity to do a 6 month internship working full-time at a company. It will equip you with a skillset to talk to people in the industry as well as allow you to explore related jobs. If you don't like doing what you did as part of your placement, that is still good because then you know what you don't want to do. For students doing other engineering specialisations, I highly recommend joining any of the student teams. As soon as people hear in my interviews that I was in Nova Rover and even FEM, they get intrigued and both my technical and non-technical experience in the teams is highlighted. Student teams are the best way to get industry experience out of industry because every student team is a tiny little company. Sometimes the sponsors for the teams end up hiring you. Even if they don't hire you, you make connections and you get to know about companies you didn't even know existed.

You were part of a student team, did part time work and also studied engineering. How did you manage your time?

For me, each thing was a break from another. For example, I would work most days so I would look forward to being in the Nova Rover workshop. After long days at the Nova Rover workshop, work the next day would seem appealing because it had a set structure and time. The important thing is to truly understand your priorities and have set times in the week for the things that you have to do but are not a personal priority. For me my priorities were Nova Rover and my job. So I would have set times throughout the week to focus on just uni work because my instinct would be to do everything but that. If I didn't have any uni tasks, I would focus more on Nova Rover. If there's an assignment, then definitely that. If a competition is coming up, then I'd prioritise Nova Rover. I would communicate to my leader at Nova Rover if an assignment came up. Everyone understands that university should be your first priority since they are students themselves.

Any tips for technical interviews?

Even if you can't think of the answer on the spot, tell them what you are thinking. They want to know what our way of processing information and coming up with a solution is. Break down the problem into small pieces and let them know. Keep talking through what you are coding and why. If you come to a standstill, let them know what the problem is and what could be the potential reasons.

What would be your final thoughts on your journey?

Volunteering at Wholefoods, FEM and working part-time gave me the confidence to talk to people. Sometimes I hated going to work but in retrospect, it was a good thing. When you've done stuff outside of uni studies, it shows the employers that you're hardworking and resilient. Any extracurricular activity where you are interacting with people or expanding your technical knowledge is amazing. Engineering student teams are a great way to gain not only technical experience but also people skills.

University was really hard at times, but I wouldn't change anything. I am happy with what I did. FEM changed my life completely, it gave me the boost I needed to start my professional journey!
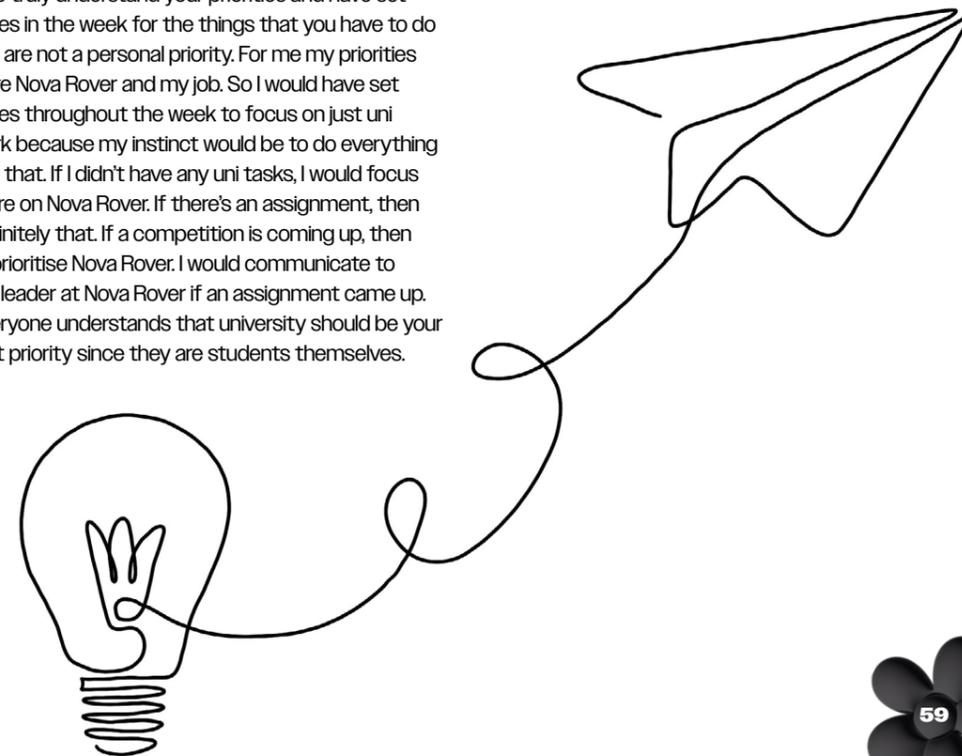
Alina Ermolaeva: Recent Graduate's Transition from Uni to Industry

Alina Ermolaeva,
Security Engineer at Telstra

By Sanika Ghanekar

Could you please tell us a bit about yourself, degree, current position, hobbies and interests?

I graduated at the end of last year with a Bachelor of Software Engineering and Commerce, majoring in Business Analytics. Currently, I work as a Security Engineer at Telstra. Previously, I had secured a position at ANZ through the IBL program at Monash during my university studies. In my free time, I enjoy running and am currently training for a marathon. I also love baking. If I have enough annual leave, I like to travel and explore new places overseas.

Can you describe your journey from university to your current role in the industry? What were some key steps you took to secure your position?

Through the IBL program at Monash during my penultimate semester, I secured a six-month internship at ANZ as a Security Engineer. This internship transitioned into a full-time role, though I worked part-time during my final semester of university. Both my positions at ANZ and Telstra have been in Security, and I'm still exploring if this is my preferred field.

I was transparent about my skills and knowledge gaps, emphasising my eagerness to learn, which helped me secure the role. Another significant stepping stone was participating in internal social events, which increased my visibility within the company. Although I received offers for graduate roles from other companies, I chose to stay with ANZ due to the excellent culture I built with other interns, the potential for growth, and the flexibility to move across different teams. I noticed there was also more opportunity for hands-on experiences compared to the work given through grad programs.

Eventually, I moved to Telstra to gain more technical experience. A tip I can offer is to maintain a strong LinkedIn profile. This platform helped me in securing my position at Telstra, as they reached out to me through my LinkedIn.

How well do you feel your university education prepared you for the demands and expectations of the industry? Are there specific areas where you felt underprepared?

My university education prepared me well in terms of learning on my own and being curious, but it fell short in certain practical areas. Given the rise in security breaches, I believe there should be some sort of introductory class on cybersecurity, including topics like cyber attacks and basic security principles. I felt underprepared in basic security knowledge. While I brought essential skills from university, such as programming, understanding different types of architecture, and object-oriented learning, much of what I needed to know about security and business rules was learned on the job. The theoretical knowledge was valuable, but practical, hands-on experience in security was missing from my education.

What technical and non-technical challenges did you face during your transition from university to industry, and how did you overcome them?

One major technical challenge was adapting to networking, continuous integration, and development pipelines, particularly on the automation side. At university, we typically ran scripts locally without learning how to execute them remotely which is crucial for many web applications. We understood the theory, like life cycle management, but didn't see how it all comes together in practice. This was a significant learning curve as there are many components involved. On the non-technical side, requirement gathering was a challenge. In university, there was no analyst to collect requirements before the engineer undertook the job. So, I had to learn how to ask the right questions to stakeholders who might not have a technical background. This was often difficult because if the questions weren't clear, the final outcome could be very different from what was needed. Learning to communicate in a way that non-technical people understand was key to overcoming this challenge.

How have you managed to maintain a healthy work-life balance and do you have any strategies you have found most effective?

I've tried to normalise not living for the weekend, following the principle "you don't live to work, you work to live." If my friends are free on a Tuesday and so am I, we meet up instead of waiting for the weekend. I've also learned to clock off at 5 pm when possible and having 'do not disturb' on Microsoft Teams during particular hours. An effective strategy is being smart with how I take my leave. While it's important to work hard and perform well, companies encourage taking time off to rest. I plan my leave strategically to ensure I get the rest I need.

Do you feel that being a woman in your industry has made your experience different from your other colleagues? If so, in what ways?

Yes, I do feel that being a woman in my industry has made my experience different. In university, the gender imbalance was noticeable, but it was easier to overlook. However, in the industry, I sometimes wonder if I am seen as a diversity hire and struggle with imposter syndrome. I frequently have had to advocate for more challenging work, understanding that business needs often require quick delivery, and I might not have enough experience. I have to push that I can shadow or collaborate with others to deliver the project. Sometimes, I feel people don't have genuine intentions. I've been encouraged to do more presentations and attend specific events, but I question whether it's because I'm a good advocate or simply to have a woman on the panel to demonstrate support for women in STEM. Thus, it's important to build strong rapport with your manager and discuss questions and doubts like these – as difficult as it may be. My current manager, for instance, champions women in the field, is transparent and consistently supports me and my work. As a woman in this industry, it's crucial to advocate for yourself and find those who genuinely support your growth.

What role did internships, student teams/clubs, or industry projects during your university studies play in your transition to your full-time role?

I was part of Monash Deep Neuron (MDN) from my third to fifth year. As the deep learning branch lead, I interacted with external stakeholders, which developed my skills in driving meetings, speaking up, and challenging topics being discussed. Participating in deep learning projects gave me some machine learning experience, which is increasingly relevant with tools like Copilot and ChatGPT. My internship at Transurban, which was a female-focused internship during COVID, taught me how to work from home effectively and gave me experience presenting to higher-level executives. In tech roles, it's crucial to explain problems to people without technical backgrounds as I've mentioned before. This skill wasn't taught extensively in university, but I developed it through my part-time job at Apple as well, where I learned to use analogies to explain technical concepts in a non-technical way.

What advice would you give to current engineering students who are about to graduate and enter the industry?

Stay curious and keep exploring different aspects of your field. You don't want to find yourself stuck in the same role for years without knowing what other opportunities are out there. Unlike previous generations who may have spent decades in one place, today's industry is constantly changing and evolving. Always challenge yourself and stay up to date with business needs. It's important to have your own opinion and make decisions based on your own judgement, rather than being influenced by others – this goes a long way. Develop strong interpersonal skills to be able to read the room, recognise when team members need help, and build good relationships with everyone. Finally, get involved in company activities like graduate events (if relevant), morning teas, or after-work drinks. Many important discussions happen outside the formal work setting and that's how networking happens. Participating in these can lead to valuable connections and potential future opportunities.
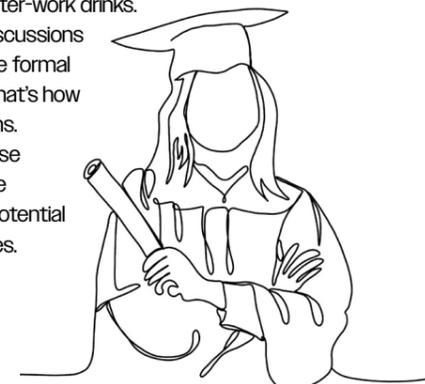
Technological Advancements and their Impacts on Engineering Practices

By Selsa Sony

In the ever-evolving landscape of engineering, three technological titans—Artificial Intelligence (AI) and Machine Learning (ML), 3D Printing, and Virtual Reality (VR)—are not just making waves; they're causing tsunamis of change. However, what are the ramifications of these transformative technologies?

AI and ML in Predicting the Future

Imagine a world where machines not only perform tasks but anticipate needs, solve problems, and even learn from their experiences. AI and ML are programmed to do just that. These technologies enable predictive maintenance, optimise design processes, and enhance decision-making. For example, AI algorithms can analyse vast datasets to predict failures before they occur, saving time and reducing costs for companies [1]. On the other hand, ML models can automate complex tasks, reducing the need for manual intervention and allowing engineers to focus on more strategic activities [2]. Furthermore, AI-driven analytics provide engineers with actionable insights, improving decision-making and problem-solving skills.

General Electric's Leap into the Future

One company that has significantly benefited from AI and Machine Learning is General Electric (GE), a global company that manufactures various power generation equipment. By implementing these technologies, GE has revolutionised its approach to maintenance and operations. Using AI-powered predictive maintenance, GE can foresee equipment failures in its vast array of machinery, from jet engines to wind turbines [3]. This foresight allows GE to schedule maintenance before any failure occurs, drastically reducing downtime and maintenance costs. AI developed by the company is also helping to reduce carbon emissions and fuel consumption, working towards a more sustainable world. The optimisation of their design processes through machine learning has also accelerated innovation, enabling GE to develop more efficient

and reliable products [4]. This transformation has not only enhanced GE's operational efficiency but also significantly boosted customer satisfaction and trust.

3D Printing: Crafting the Future

3D Printing is revolutionising the way prototypes and customised parts are created. This technology allows engineers to meet specific design requirements and functional needs [5]. For instance, aerospace engineers can use 3D printing to produce lightweight, high-strength components that improve fuel efficiency and reduce emissions [6]. The cost and automation benefits of 3D printing are significant. Traditional manufacturing methods often require expensive equipment, whereas 3D printing allows for the direct creation of parts from digital designs. This reduces initial setup costs and enables rapid prototyping, allowing engineers to iterate designs quickly and bring products to market faster. Automation in 3D printing also reduces labour costs and increases precision, further driving down production costs and improving quality. Additionally, 3D printing contributes to sustainability by minimising waste and reducing the carbon footprint of manufacturing processes [7].

Revolutionising the Automotive Industry: Ford's Journey

A notable example of 3D printing's impact can be seen in the automotive industry with Ford Motor Company. Ford has embraced 3D printing to revolutionise its manufacturing processes, especially in preparation to release their first all-electric vehicle [8]. By using 3D printing to create prototypes and even some end-use parts, Ford has significantly reduced the time and cost associated with traditional manufacturing. This innovation allows Ford to quickly iterate on designs, bringing new models and features to market faster than ever before. Furthermore, the precision and customisation capabilities of 3D printing have enabled Ford to enhance the performance and aesthetics of its vehicles, leading to higher customer satisfaction and a competitive edge in the market.

Virtual Reality: Stepping Into the Design Before It's Real

Virtual Reality (VR) is also making substantial contributions to engineering practices. It offers immersive experiences that can be used for training, design visualisation, and remote collaboration. Engineers can use VR to create virtual prototypes, allowing for detailed inspection and testing before physical production begins [9]. This reduces the risk of design flaws and enhances the overall quality of the final product. VR training modules can simulate complex engineering scenarios, providing hands-on experience without the associated risks and costs of real-world training. VR reduces the need for physical travel, lowering the carbon footprint associated with on-site meetings and inspections. This technology also enhances user experience and training by offering immersive learning environments that prepare engineers for real-world challenges.

Boeing Soars with VR Innovation

The aerospace giant has incorporated VR into its design and training processes, revolutionising how its engineers work. At Boeing's Virtual Reality Centre, Boeing's engineers can walk through virtual prototypes of new aircraft and weapons, identifying potential issues and adjusting before any physical model is built. This capability has significantly reduced design errors and shortened development times. Additionally, Boeing uses VR for training, allowing technicians to practise complex assembly and maintenance tasks in a safe, controlled virtual environment [10]. This immersive training has improved skill acquisition and reduced the training time by 75%, leading to more efficient and effective operations.

Embracing the Future Together

The integration of AI and ML, 3D Printing, and VR into engineering practices is driving significant improvements across various dimensions. These technologies are enhancing applications, leading to high results in operational efficiency, sustainability, and user training, ultimately transforming the engineering landscape and paving the way for a more efficient and sustainable future. Companies like GE, Ford, and Boeing exemplify how embracing these advancements can lead to remarkable transformations and set new standards in the industry. The future of engineering is bright, and these technological advancements are lighting the way forward.

References

[1] C. Yaiprasert and A. N. Hidayanto, "AI-powered ensemble machine learning to optimize cost strategies in logistics business," International Journal of Information Management Data Insights, vol. 4, no. 1, p. 100209, Apr. 2024, doi: https://doi.org/10.1016/j.jjimei.2023.100209.

[2] M. Soori, B. Arezoo, and R. Dastres, "Artificial Intelligence, Machine Learning and Deep Learning in Advanced Robotics, A Review," Cognitive Robotics, vol. 3, no. 1, 2023, doi: https://doi.org/10.1016/j.cogr.2023.04.001.

[3] F. Kusznir, "How AI is accelerating the Energy Transition and carbon negative | GE Digital," www.ge.com. https://www.ge.com/digital/blog/ai-accelerating-energy-transition-carbon-negative

[4] J. Vinyard, "AI/ML and Renewable Energy Trading | GE Digital," www.ge.com. https://www.ge.com/digital/blog/how-artificial-intelligence-ai-and-machine-learning-ml-streamlines-renewable-energy-trading

[5] T. Rayna and L. Striukova, "From rapid prototyping to home fabrication: How 3D printing is changing business model innovation," Technological Forecasting and Social Change, vol. 102, no. 1, pp. 214–224, Jan. 2016, doi: https://doi.org/10.1016/j.techfore.2015.07.023.

[6] Abdul Hai Alami et al., "Additive manufacturing in the aerospace and automotive industries: Recent trends and role in achieving sustainable development goals," Ain Shams Engineering Journal, vol. 14, no. 11, pp. 102516–102516, Nov. 2023, doi: https://doi.org/10.1016/j.asej.2023.102516.

[7] M. A. Olawumi, B. I. Oladapo, O. M. Ikumapayi, and J. O. Akinyoola, "Waste to wonder to explore possibilities with recycled materials in 3D printing," Science of The Total Environment, vol. 905, pp. 167109–167109, Dec. 2023, doi: https://doi.org/10.1016/j.scitotenv.2023.167109.

[8] D. Leggett, "Ford starts production at Cologne EV manufacturing centre," Just Auto, Jun. 04, 2024. https://www.just-auto.com/news/ford-opens-cologne-ev-manufacturing-centre-2/#:~:text=Ford%20has%20opened%20the%20Cologne (accessed Jul. 26, 2024).

[9] M. Hovanec, P. Korba, M. Vencel, and S. Al-Rabeei, "Simulating a Digital Factory and Improving Production Efficiency by Using Virtual Reality Technology," Applied Sciences, vol. 13, no. 8, p. 5118, Jan. 2023, doi: https://doi.org/10.3390/app13085118.

[10] InfiVR.com, "Boeing Cuts 75% training time with VR & Increases accuracy by 33% using AR," Medium, Jun. 13, 2021. https://infivr.medium.com/-a11a38d22f0d

Women and The Future of Software Engineering

By Reem El Machtoub
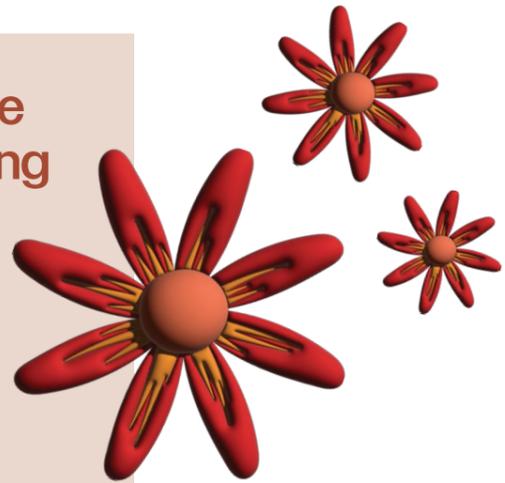
Amid a rapidly advancing artificial intelligence (AI) era, a plethora of questions is arising about the future of software engineering. Certain doubts may be surfacing about AI taking over much of the computer science/software engineering domain. However, this ever-changing engineering specialization continues to grow, and the need for creative thinkers in the Software Engineering field has never been greater. In fact, software engineering jobs are projected to grow by 22% until 2029, according to the US Bureau of Labor Statistics [1].

Recent Innovations in the Software Engineering Field

Climb in Cloud Computing

Cloud computing is a prominent trend in the world of Software Engineering. This refers to the access of computing resources such as physical or virtual servers, software, and more, through the internet as opposed to local servers and infrastructure. Cloud computing offers cost-effectiveness through eliminating the need for on-premises infrastructure, while increasing speed of software development due to access to cloud-based software and offers up-to-date innovations and technologies [2].

Blockchain Breakthrough

Blockchain oriented software is also a rising trend as blockchain technology increases in significance in the finance industry[1]. Blockchain can be described as a shared digital ledger that enhances the recording of transactions and assets. It provides immediate and accurate information to users, thus providing greater trust, security, and efficiency due to its immutable nature after validation of its transactions [3].

Cybersecurity Career Growth

Another trend on the rise in technology and software engineering is cybersecurity. Artificial intelligence is being used to develop more sophisticated cyberattacks. With the growth in the AI field and the increased digital transformations of businesses, cybersecurity is more important than ever. Thus, despite the increase in generative AI, human intervention is still crucial in the developing world of software engineering and will continue to be so for many years to come.
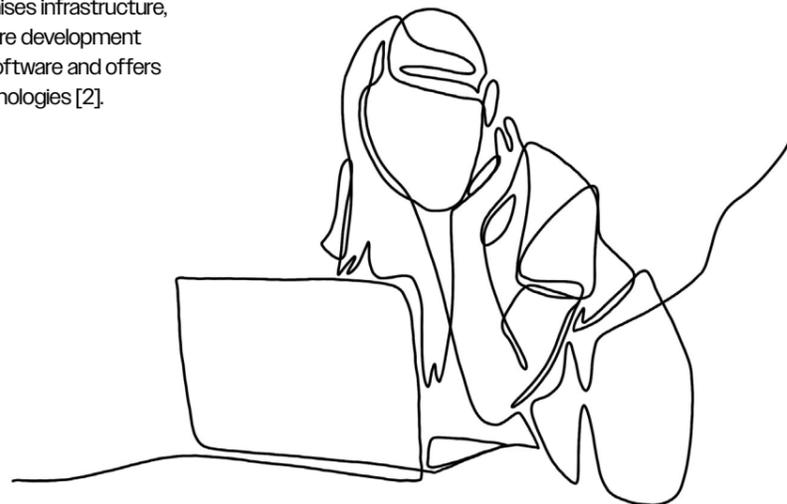
Women in the field of Software Engineering

Women in the technological domain have been prominent since the term "software engineering" was coined by Margaret Hamilton who led the software engineering division for NASA's Apollo program in the 1960s[4]. Studies show that diversity increases chances for innovation, and women represent a significant, yet underutilized, source of talent that can strengthen the technical workforce [5].

Women Leading in AI Ethics

These days, women are a serious driving factor in the development of ethical generative AI. In fact, the world's first chief AI ethics officer is Kay Firth Butterfield, the CEO of the Center for Trustworthy Technology [6].

Fei-Fei Li's Impact on AI and Image Recognition

Another prominent woman in the AI field is Fei-Fei Li, a computer scientist known for establishing ImageNet which played an essential role in advancing computer vision across image classification, object recognition, and object localization [7]. Li continues to be a trailblazer in the technological field. From Stanford's Human Centered AI institute, she is celebrated for her significant contributions to AI image recognition and her advocacy for inclusive and ethical AI development[6].

Parisa Tabriz: Innovator in Cybersecurity

In the cybersecurity sector, Parisa Tabriz is known for her innovative problem-solving approaches. A manager of Google's product and service security, Tabriz has advocated the need for more women in cybersecurity while demonstrating strong support for diversity and inclusion within the technology industry [8].

These are just a few examples of the many women trailblazers in the field of technology and software engineering that are paving the way for many more to follow.
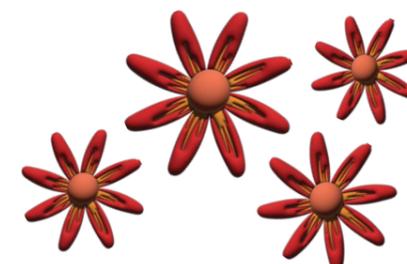
Current Statistics

Despite the remarkable work done by women in the tech and software engineering field, there remains a huge gender gap in the field. Women make up less than 30% of the tech workforce, with a 27.6% representation estimate in 2022 [9]. Even with a steady annual growth rate of 5%, it would take about 12 years to achieve equal representation in the tech industry[9].

Concluding Thoughts

Women have been driving the advancement of tech and software behind the scenes ever since Ada Lovelace designed an algorithm for the early computing machine [10]. Lovelace is considered by many to be the world's first computer programmer. As such, women are capable of being at the forefront of the world of software while driving developments.

In addition, as long as the field of software engineering is thriving, women will continue to innovate as they are a great asset to this field. The future of software engineering looks bright, and women's plethora of successes and visionary ideation in this field continue to inspire, paving the way for transformative advancements and inclusive innovation.

References

[1] "What is the Future of Software Engineering [2023 and Beyond]," www.knowledgehut.com. https://www.knowledgehut.com/blog/web-development/software-engineer-future#what-is-the%C2%A0future-of%C2%A0software%C2%A0engineers

[2] S. Susnjara and I. Smalley, "What is cloud computing," www.ibm.com, Feb. 14, 2024. https://www.ibm.com/topics/cloud-computing

[3] IBM, "What Is Blockchain Technology," www.ibm.com, 2023. https://www.ibm.com/topics/blockchain

[4] R. Chow, "Margaret Hamilton: The First Software Engineer," History of Data Science, Aug. 19, 2021. https://www.historyofdatascience.com/margaret-hamilton-the-first-software-engineer/

[5] Improved IT Performance Correlated With Gender Diversity but Only 25% of IT Jobs Held by Women - Organizations Must Adjust Recruitment Efforts to Compete, Says Info-Tech Research Group. (2022). In PR Newswire. PR Newswire Association LLC.

[6] C. Montgomery, "The 'hidden figures' of AI: Women shaping a new era of ethical innovation," IBM Blog, Mar. 27, 2024. https://www.ibm.com/blog/the-hidden-figures-of-ai-women-shaping-a-new-era-of-ethical-innovation/

[7] R. Chow, "ImageNet: A Pioneering Vision for Computers," History of Data Science, Aug. 27, 2021. https://www.historyofdatascience.com/imagenet-a-pioneering-vision-for-computers/

[8] "How Women in Technology are Driving Innovation and Change," Overproof, Mar. 08, 2023. https://overproof.com/2023/03/08/women-in-technology-innovation-change/#:~:text=1%20Artificial%20Intelligence%20Innovation%20Women%20are%20actively%20advancing

[9] Zhou, L. (2024b, May 27). Women in Tech Statistics: Gender Diversity in Tech [2024]. Luisa Zhou. https://luisazhou.com/blog/women-in-tech-statistics/

[10] B. Morais, "Ada Lovelace, the First Tech Visionary," The New Yorker, Oct. 15, 2013. https://www.newyorker.com/tech/annals-of-technology/ada-lovelace-the-first-tech-visionary

A Career In Research

By Imogene Jones
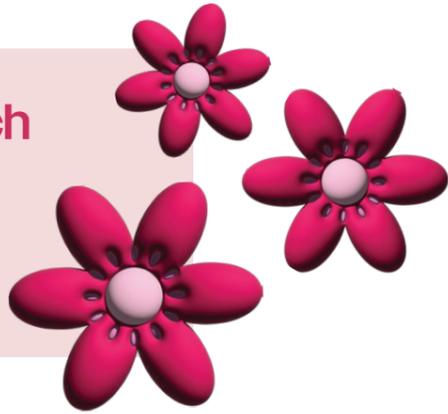
Have you ever considered a career in research? If you love solving complex problems, research might be your perfect fit. Imagine working on groundbreaking discoveries and new technologies that can change the world. Research in engineering isn't just about crunching numbers or working in a lab all day - it's a rewarding career path that lets you work your creativity, sharpen your problem-solving skills, and apply your technical expertise to real-world challenges that can transform industries and improve lives.

Style of Work in Engineering Research

Work-Life Balance

Work-life balance in research varies, but generally, research roles in academia offer more flexible schedules than industry positions. Researchers often have the autonomy to set their hours, leading to a more balanced lifestyle [1].

Gender Disparity

The flexibility in research careers can play a significant role in reducing gender disparity in engineering. Research settings typically offer more accommodating schedules for everyone, which helps alleviate the stigma that women face when seeking flexibility due to family responsibilities. When all researchers, regardless of gender, have the option to balance their professional and personal lives, it creates a more inclusive environment where researchers can thrive without the constraints often found in more rigid corporate settings. This flexibility not only helps address underrepresentation but also supports a diverse and innovative workforce [2].

Day-to-Day Work

The day-to-day work of an engineering researcher involves various activities, including:

- **Literature Review:** Analysing scientific papers to stay updated with field advancements.
- **Experimental Design and Testing:** Planning and conducting experiments or simulations to test hypotheses.
- **Data Analysis:** Using statistical and computational tools to analyse results, process data, and create visualisations.
- **Collaboration and Meetings:** Working with colleagues, technicians, and industry partners, often extending internationally.
- **Writing and Publishing:** Preparing research papers and presentations for the scientific community, which is crucial for career advancement.
- **Teaching and Mentoring:** Teaching and mentoring students, especially in academic settings.
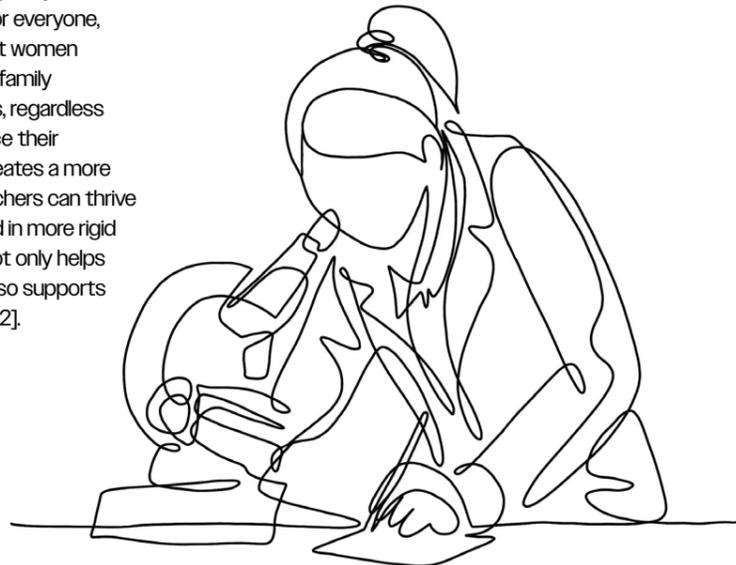
Research Focuses throughout Engineering Disciplines

Aerospace Engineering

Focuses on improving aircraft and spacecraft design, propulsion systems, and the safety and efficiency of air travel. Projects might contribute to next-generation fighter jets, fuel-efficient aeroplanes, or space exploration technologies [3].

Biomedical Engineering

Advances healthcare through medical devices, imaging systems, and biocompatible materials. Projects include creating artificial organs, developing wearable health devices, or improving diagnostic imaging [4].

Chemical Engineering

Encompasses process optimisation, catalysis, and sustainable energy solutions. Research areas include pharmaceuticals, nanotechnology, and environmental protection, focusing on developing new processes and innovative materials [5].

Civil Engineering

Addresses infrastructure challenges, focusing on sustainable and resilient structures. Research areas include structural engineering, geotechnical engineering, transportation, and water resources management [6].

Electrical Engineering

Covers electronics, telecommunications, and power systems, focusing on technologies that enhance communication, energy distribution, and control systems. Projects include designing semiconductor devices and developing renewable energy systems [7].

Environmental Engineering

Focuses on solving environmental problems and promoting sustainability. Key areas include water and air quality management, waste treatment, and renewable energy, with projects addressing pollution control and climate change impacts [8].

Materials Engineering

Involves developing materials with specific properties for various applications, focusing on nanotechnology, biomaterials, and advanced composites. Projects might include creating lightweight materials for aerospace or biocompatible medical implants [9].

Mechanical Engineering

Covers robotics, thermodynamics, and fluid mechanics, focusing on improving mechanical systems and enhancing energy efficiency. Projects may involve robotic systems, energy-efficient engines, or advanced manufacturing processes [10].

Mechatronics Engineering

Integrates mechanical, electrical, and computer engineering to develop intelligent systems and automation technologies. Research areas include robotics, control systems, and embedded systems [10].

Software Engineering

Improves software development processes, enhances software reliability, and develops innovative applications. Areas include artificial intelligence, cybersecurity, and software architecture, with projects on machine learning algorithms and secure systems [11].

Engineering research is an exciting and rewarding career path for anyone passionate about innovation and technology. Whether you're dreaming of developing cutting-edge aerospace technologies, designing life-changing healthcare devices, or creating solutions for a more sustainable planet, a career in research can help you make a real impact. If you're eager to explore new ideas and solve complex problems, dive into research and see where it takes you!

References

[1] M. Petre and G. Rugg, The Unwritten Rules of PhD Research, 2nd ed. Maidenhead, UK: McGraw-Hill Education, 2010.

[2] S. A. Hewlett, C. B. Luce, and L. J. Servon, Stopping the exodus of women in science, Harvard Business Review, vol. 86, no. 6, pp. 22-24, Jun. 2008.

[3] J. D. Anderson, Introduction to Flight, 7th ed. New York, NY, USA: McGraw-Hill Education, 2010.

[4] W. M. Saltzman, Biomedical Engineering: Bridging Medicine and Technology. Cambridge, UK: Cambridge University Press, 2009.

[5] I. Regupath, S. Vidya and T. Murugesan. Recent Advances in Chemical Engineering. Select Proceedings of ICACE, 2015.

[6] W.-F. Chen and L. Duan, Bridge Engineering Handbook. Boca Raton, FL, USA: CRC Press, 2014.

[7] S. Rabindra, Innovations in Electrical and Electronic Engineering. Proceedings of ICEEE 2022, Vol I, 2022.

[8] J. R. Mihelcic and J. B. Zimmerman, Environmental Engineering: Fundamentals, Sustainability, Design, 2nd ed. Hoboken, NJ, USA: John Wiley & Sons, 2014.

[9] W. D. Callister and D. G. Rethwisch, Materials Science and Engineering: An Introduction, 9th ed. Hoboken, NJ, USA: John Wiley & Sons, 2014.

[10] R. H. Bishop, The Mechatronics Handbook. Boca Raton, FL, USA: CRC Press, 2002.

[11] I. Sommerville, Software Engineering, 10th ed. Harlow, UK: Pearson Education, 2015.

Unconventional Pathways in Engineering

Why an Engineering Degree is one of the most valuable and flexible degrees.

By Kelly Li
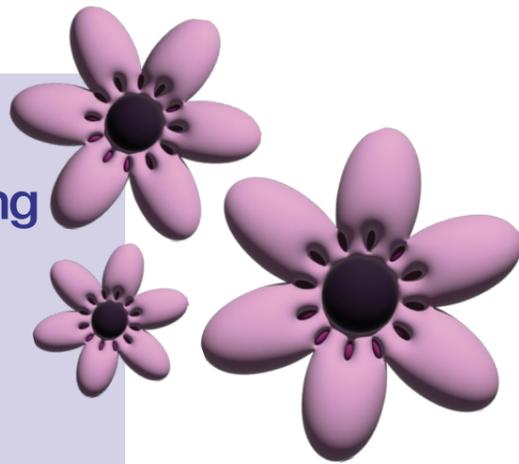
Why would you pursue an engineering degree if you don't want to become an engineer? You don't pursue a degree in medicine to not work in the healthcare field. Nor do you pursue a degree in education if you don't want to work in the education sector, so why engineering?

The reality is that with an engineering degree, a plethora of job opportunities open up for you after you complete your course, in fields other than engineering such as business, IT, management etc. (Hadlow, n.d.) An engineering degree provides valuable skills due to the engineering mindset – it's why engineering degrees are required in the first place. The degree provides value both technically by providing a strong foundation of knowledge for whatever specialisation you are studying in and also solidifies your skills in the engineering principles of problem solving and critical thinking (Farnam Street Media, n.d.).

That being said, with this engineering mindset, what are the three most common jobs that those with an engineering degree go into apart from engineering?
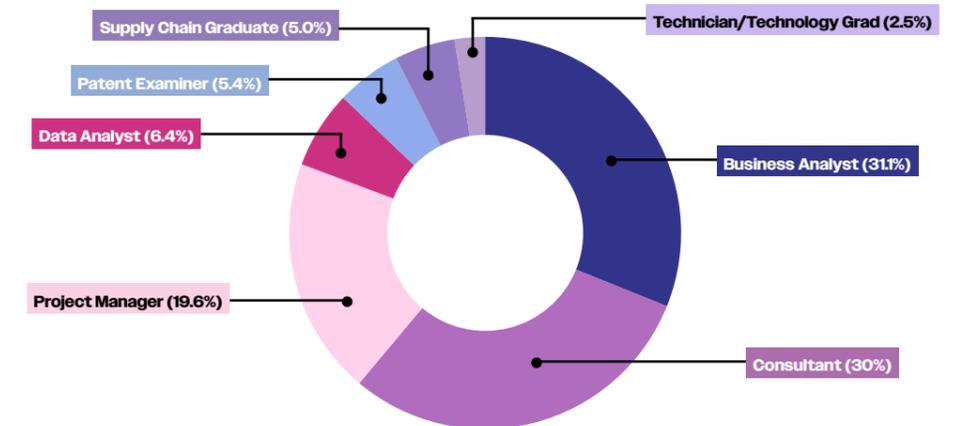
1. **Business Analyst**: Business Analysts recognise areas that an organisation can increase its efficiency and effectiveness within their teams. They use data analytics to help leverage the company's growth by increasing revenue or optimising costs. They have to have a solid understanding on forecasting, budgeting, financial analysis to align with the key performance indicators of the business (White, 2023). Business analysts need to have an analytical mindset. They need to spot areas in which they can help the business grow and improve. This is exactly what an engineer does – usually from a technical perspective. Therefore the skills from an engineering degree seamlessly translate – instead of analysing and solving problems for a technical problem you are doing so for a business. Business analysts are needed everywhere, in all types industries.

2. **Management Consultant**: Management consultants solve big and elaborate problems for organisations. They provide advice and strategies to help the financial and strategic health of an organisation. To be a management consultant, you must thoroughly understand your client's problem and be an expert in your field, using lots of research and data to back up your recommendations (Management Consulted, 2023).
    Again, it is about the engineering mindset that matters. Management consultants essentially help solve technical problems for clients rather than a company itself. However, as a consultant you require more communication and soft skills as you will constantly update your client with your progress. Using the critical thinking and process learning that comes with an engineering degree readily sets a person up to be a consultant.
    Bonus: BCG, Atlassian, BAE Systems, Aurecon and GHD are just a few of the companies that hire consultants!

3. **Project Management:** Project managers are the coordinators of a project, connecting tools, team members and skills to present projects that meet goals and fulfil requirements. As a project manager you must be able to rally your team under your guidance, unite them under meaningful objectives and allow communication and discussions to flow to ultimately create a successful project (Association of Project Managers, n.d.). Project managers have to know everything that is happening in every team all at once. They must be proactive, problem solvers and leaders to help with any problems that arise. An engineering mindset allows you to solve any problem when they emerge from a project, the same mindset that is used to look at how to achieve solutions you can transfer to a project management role.

Engineers also go into:

Supply Chain Graduate (5.0%)
Patent Examiner (5.4%)
Data Analyst (6.4%)
Project Manager (19.6%)
Technician/Technology Grad (2.5%)
Business Analyst (31.1%)
Consultant (30%)

(Statistics from Prosple Source)
As you can see engineering degrees can thrive in all sorts of fields. Ultimately, it all depends on how you approach your degree and the opportunities that you take on. The engineering mindset can be used everywhere from business, IT to management, making it one of the most versatile and sought out degrees out there. An engineering degree equips graduates with the skills to thrive in various industries, making your time studying for an engineering degree all worthwhile in the end.
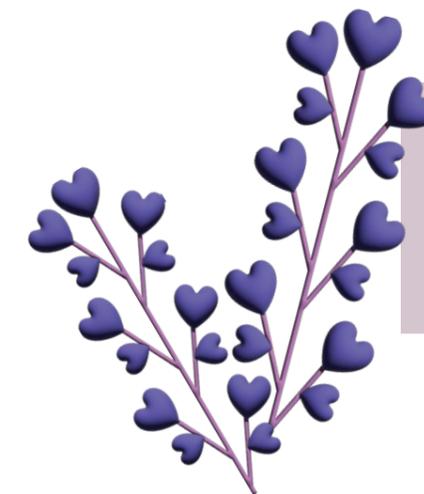
References

Hadlow/Prosple Article: https://au.prosple.com/career-planning/what-can-i-do-with-an-engineering-degree-apart-from-being-an-engineer

Farnam Street Media: https://fs.blog/the-engineering-mind-set/

US Article: https://au.prosple.com/career-planning/what-can-i-do-with-an-engineering-degree-apart-from-being-an-engineer

Business Analyst: https://www.cio.com/article/276798/what-is-a-business-analyst-a-key-role-for-business-it-efficiency.what-is-a-business-analyst-a-key-role-for-business-it-efficiency.html

Project Management: https://www.apm.org.uk/jobs-and-careers/career-path/what-does-a-project-manager-do/

Women Led Engineering Startups

By Jazlyn Thanyasmith

Breaking Barriers and Leading Innovation

Some trail-blazing women led engineering start-ups include:

*   **4D Healthware:** Founded by Star Cunningham, 4D Healthware develops technological advancements to help improve efficiency in healthcare, especially those in more disadvantaged communities with "smart" learning systems and wearable technology

*   **Affectiva:** Rana el Kaliouby and Rosalind Picard worked to create a machine-learning based software that can interact with humans and recognise their emotions based off non-verbal cues, so that AI systems can better interact with humans

Embarking on the journey of launching an engineering startup can be both exhilarating and daunting. For aspiring students eager to transform innovative ideas into successful ventures, understanding the foundational steps and overcoming common challenges is a crucial step. But don't fear because here are some strategies for aspiring engineers to help navigate the startup landscape! We've got some tips for those aspiring start-up founders from identifying a pressing problem to navigating potential obstacles.

Steps for Aspiring Students

For students interested in starting their own engineering ventures, there are several actionable steps to consider:

1. **Identify a Problem and Develop a Solution:** Start by pinpointing a specific problem or gap in the market that you are passionate about. Conduct thorough research to understand existing solutions and identify opportunities for innovation. Your startup should aim to provide a unique and effective solution to this problem.

2. **Build a Strong Network:** Networking is crucial in the startup world. Engaging with industry professionals, attending conferences, and joining relevant organisations or groups can build relationships with mentors, potential partners, and investors. These connections can provide invaluable guidance and open doors to new opportunities.

3. **Assemble a Talented Team:** A successful startup is rarely a solo endeavour. Forming a team of individuals with diverse skills who share your vision and possess complementary expertise can enhance creativity, drive, and problem-solving capabilities.

4. **Seek Funding and Support:** Explore various funding options such as venture capital, angel investors, and government grants. Many organisations and programs specifically support women-led startups and offer financial assistance, mentorship, and resources. Investigate local and national programs designed to support female entrepreneurs.

Overcoming Challenges

Starting a business comes with its share of challenges, particularly in a field like engineering where technical complexity is high. Here are some strategies to overcome common obstacles:

1. **Navigating Funding Hurdles:** Securing funding can be challenging, so consider applying for grants and participating in pitch competitions designed to support founders. Additionally, building a solid business plan and demonstrating a clear path to profitability can make your startup more attractive to investors.

2. **Balancing Technical and Business Skills:** Engineering entrepreneurs often need to balance technical expertise with business acumen. Investing time in learning about business management, marketing, and finance and collaborating with co-founders or advisors who have strong business skills can significantly help to bridge this gap.

3. **Dealing with Implicit Bias:** Women entrepreneurs may encounter gender biases in the startup world. Build confidence in your abilities and surround yourself with supportive mentors and peers. Developing a strong network can provide encouragement and valuable advice, helping to overcome any bias you may face.

4. **Maintaining Resilience:** Entrepreneurship requires resilience and perseverance. Don't forget to embrace failures as learning experiences and remain adaptable. Set clear goals, celebrate milestones, and always keep your long-term vision in focus.

Creating your own women-led engineering startup will undoubtedly be an exciting and challenging journey. However, with perseverance and a strategic approach, you can turn your innovative ideas into reality and drive meaningful change in the engineering field.

References

A. Kapin. "50 Women-Led Startups That Are Crushing Tech". forbes.com. Accessed: Jul. 26, 2024. [Online.] Available: https://www.forbes.com/sites/allysonkapin/2019/02/20/50-women-led-startups-who-are-crushing-tech/

K. Stewart. "How to build a startup engineering team". increment.com. Accessed: Jul. 26, 2024. [Online.] Available: https://increment.com/teams/how-to-build-a-startup-engineering-team/

Affectiva. "Affectiva and Emotion AI". affectiva.com. Accessed: Jul. 26, 2024. [Online]. Available: https://www.affectiva.com/emotion-ai/

4D Healthware. "About 4D Healthware". 4dhealthware.com. Accessed: Jul. 26, 2024. [Online.] Available: https://4dhealthware.com/about/

Building Tomorrow's Leaders: The Role of Women in Engineering's Future

By Suey Ho

As more women are entering the field of engineering, this is creating more gender diversity within the engineering industry . According to the Department of Industry, Science, and Resources, 23% of senior management and 8% of CEOs in STEM-qualified industries are women [1]. Women in engineering still face several barriers, including bias, lack of mentorship, and work-life balance issues, which hinders their advancement to leadership positions; however women continue to prosper in the industry.

Pioneering Women in Engineering

Diversity in leadership leads to more innovative and creative solutions. Leading women in engineering play a crucial role in inspiring the next generation who'll follow in their steps. Visible women leaders in engineering demonstrate that it is possible to achieve success in this field, motivating young girls to pursue their dreams. Let's take a closer look at some of the successful women engineers who have reached senior positions [2].

- **Amanda Spencer** *Director, Solution Engineering, ANZ at Cloudflare*
  Amanda Spencer is an experienced Solutions Engineering Director at Cloudflare, providing a global cloud platform. She has a proven track record in influencing the sales process and excelling in competitive markets.

- **Avital Arora** *Sr. Director, Software Engineering at Google*
  Avital is a results-oriented and execution-focused engineering leader with a proven track record of delivering enterprise-quality products.

- **Praema Ranga,** *Engineering Capability Manager at Boeing Defence Australia*
  Praema is a mechanical engineer with over 20 years' experience, currently leading teams in the field of Air Combat and Electronic Attack.

- **Hope Yanling Yin** *SVP, Head of Engineering Engagement at U.S. Bank*
  Hope is an award-winning executive coach and founder of Blueprint Coaching. She is also an award-winning executive at a Fortune 150 company and was the Global Head of Talent Development Technology at a Fortune 25 company.

- **Kelly Mulroney** *SVP, Product & Engineering at Cox Automotive*
  Kelly is the Senior Vice President of Product & Engineering for Cox Automotive Commerce Solutions, Kelly Mulroney leads a team managing product and engineering in different industry sector.

These women have made significant contributions to their fields.

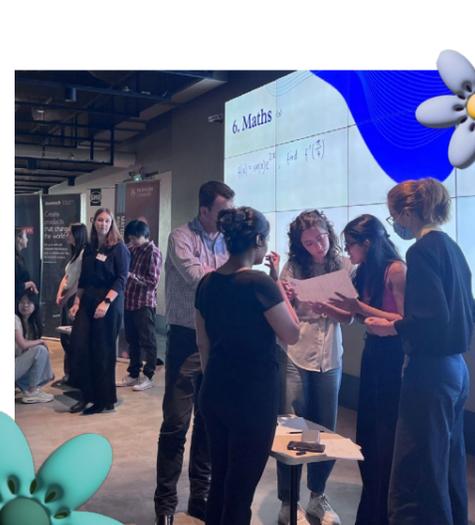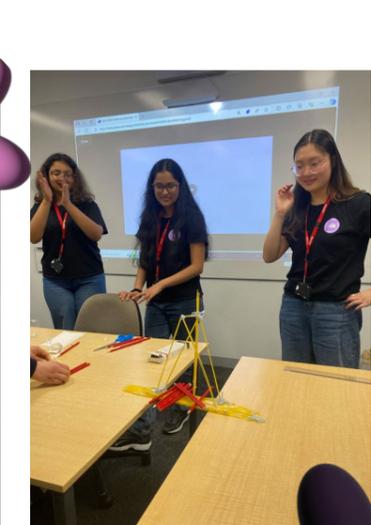### Key Strategies for Building Future Leaders[3][4]

1. **Pursue Continuous Learning**
   Ongoing education and hands-on experience are essential for professional growth and staying current with industry advancements. Women engineers should take every opportunity to learn and expand their skill sets.

2. **The Importance of Mentorship and Support Networks**
   There are many mentorships that are available to help women to thrive in engineering studies and careers including Monash Women in Engineering Mentoring Program, Engineers Australia's Mentoring Program. Mentoring from industry legends and active involvement in these professional associations can help career development.

3. **Networking and Volunteering**
   Events like Women in Engineering Summit and Engineers Without Borders offer platforms for networking, learning, and sharing experiences. They create a sense of community and provide opportunities for professional growth and broaden your perspectives.

The Impact of Women Leaders in Engineering

The increasing presence of women in engineering is a positive trend that promises to shape the future of leadership in the field. Despite the challenges, women are making significant strides and paving the way for future generations. With more women leaders in engineering, the future is bright. These leaders will drive innovation, inspire the next generation, and contribute to a more diverse and successful engineering industry.

References

[1] "The state of STEM gender equity in 2023 | Department of Industry Science and Resources." Accessed: Jul. 29, 2024. [Online]. Available: https://tinyurl.com/4m75v4au

[2] "Celebrating IWED 2024: 30 Outstanding Women in Engineering Leadership | Women in Tech Network." Accessed: Jul. 29, 2024. [Online]. Available: https://tinyurl.com/4757w5pe

[3] "Q&A: Navigating your engineering career path with purpose, passion and ingenuity | Women In Engineering Summit." Accessed: Jul. 29, 2024. [Online]. Available: https://tinyurl.com/ddz8fpdb

[4] "9 Women Leaders In Engineering Share Their Breakthrough Conversations | LinkedIn." Accessed: Jul. 29, 2024. [Online]. Available: https://tinyurl.com/5n8esrps

Acknowledgements

Special thanks to...

Thank you to all our sponsors who helped make this Industry Guide possible:

aurecon

LOCKHEED MARTIN
AUSTRALIA

MONASH MATERIALS SCIENCE AND ENGINEERING

MONASH University

Invetech

GHD

Australian Government | ANSTO

ARCADIS

BAE SYSTEMS

wood.

S&C

beon Energy Solutions

CITIPOWER

Powercor AUSTRALIA

united energy

AURORA ENERGY RESEARCH

BCG

ExxonMobil

Honeywell

Stantec

ATLASSIAN

74

Content Contributors and Editors:

Ashali Haputhanthri	Vicky Huang	Kelly Li
President	*Vice President*	*Secretary*

Naree Khuon	Sanika Ghanekar	Imogene Jones	Jazlyn Thanyasmith
Marketing Director	*Events Director*	*Treasurer*	*Assistant Treasurer*

Charlotte Evans	Kayla Larbi	Selsa Sony	Bhavya Pathak
Events Officer	*Events Officer*	*Outreach Officer*	*Outreach Officer*

Yokabit Fesshaye	Disha Rishi Kundra	Elise Vayenas	Suey Ho
Marketing Officer	*Marketing Officer*	*General Representative*	*General Representative*

Lakshmi Palaniappan	Vanshika Gupta	Yesha Tesoro	Clare Ahn
1st Year Representative	*1st Year Representative*	*2nd Year Representative*	*2nd Year Representative*

Organisers and Designer:

Claire Zhang	Dheekshanya Anuradhai	Joy Jasmine Kaur	Reem El Machtoub	Lucinda Nguyen
Industry Director	*Assistant Industry Director*	*Industry Officer*	*Industry Officer*	*Graphic Designer*

GET IN TOUCH!

✈ wem@monashclubs.org

📷 @wem_monash

f www.facebook.com/WEM.monash

in linkedin.com/company/womeninengatmonash

WOMEN IN ENGINEERING AT MONASH

WEM