

# CAREERS WITH STEM™ JOB KIT



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# ELECTRICAL ENGINEER

Power up your future with a career  
full of security and opportunity

SUPPORTED BY



MACQUARIE  
University

# (YOU)<sup>us</sup>

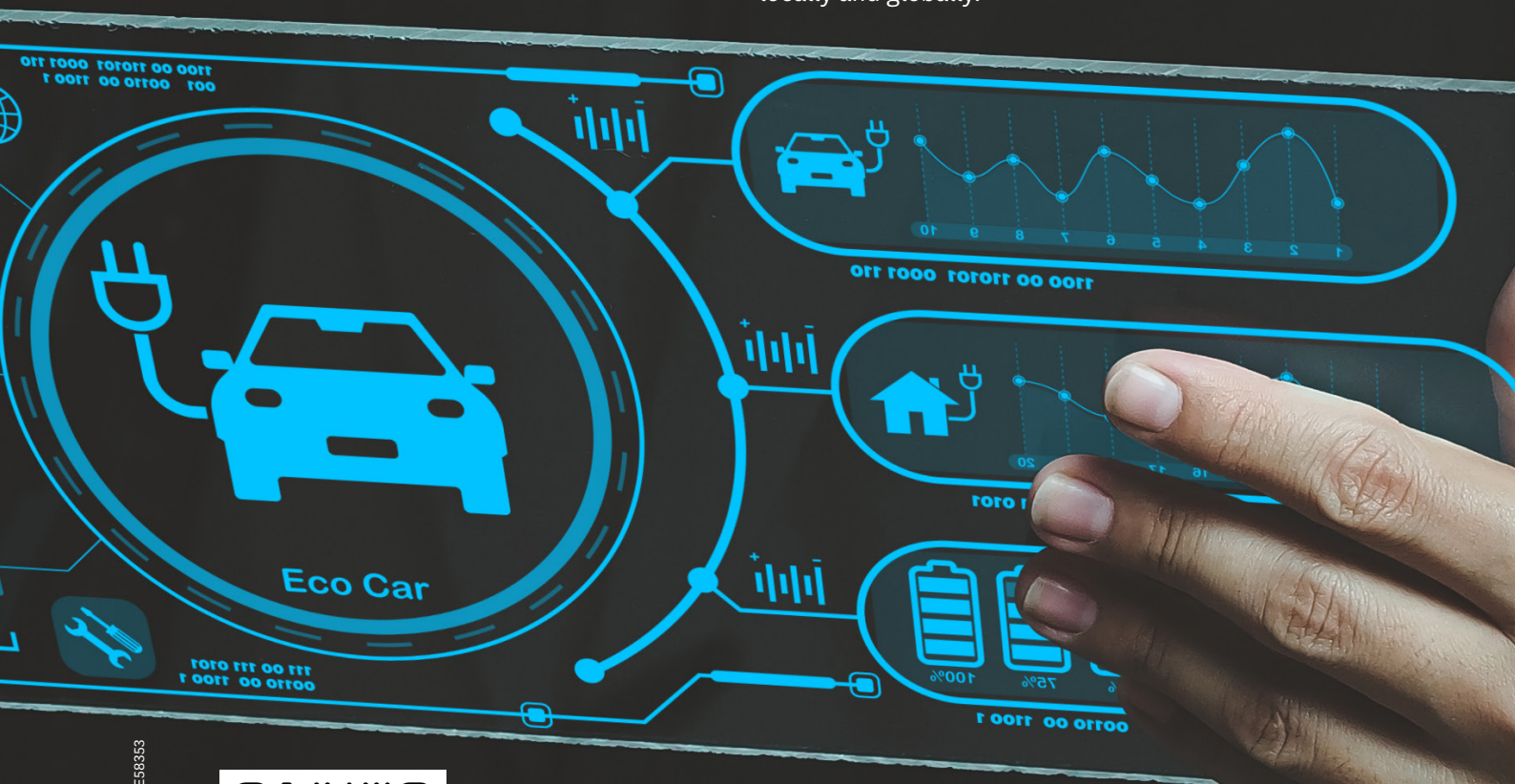
## CAN BUILD A CLEANER, BRIGHTER FUTURE

Electrical engineers are at the forefront of inspiring change by creating ways to power the world. Studying electrical engineering generates opportunities for cutting-edge careers of the future across innovative electronic technologies, such as electric vehicles, clean energy, smart homes, improved healthcare systems and more.

With its emphasis on practical, real-world learning, Macquarie's Bachelor of Engineering (Honours) specialising in Electrical and Electronic Engineering, equips you with the skills and knowledge needed to create the technology of tomorrow and contribute to shaping a cleaner, smarter future for communities locally and globally.



**MACQUARIE**  
University  
SYDNEY · AUSTRALIA



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**FIND OUT MORE  
AND APPLY TODAY.**



# ELECTRICAL ENGINEERING IS EVERYWHERE

As our energy system goes green, electrical engineers can have a real impact on the world



**PROFESSOR AMAN MAUNG THAN OO**  
DEAN, SCHOOL OF ENGINEERING  
MACQUARIE UNIVERSITY

If you look around you there are very few things you touch that don't rely on electrical engineers to work. Whether it be the power systems we connect to, the transport we use, or almost every way we communicate, electrical engineering plays a role. In the pages of this guide you'll see the diversity of careers you can do with electrical engineering, a field that is evolving and thriving.

Having spent my career in electrical power engineering and renewable energy, I can see the growing shortage of engineers first hand. Electrical engineers that look after the power industry of old are now retiring. We need a whole new cohort of electrical engineers to take their place as renewable energy grows. But even if you're not keen on the power industry, there are plenty of exciting opportunities in communications, manufacturing and defence, to name a few.

As a student, electrical engineering caught my imagination better than any other field of engineering. For example, when energy is transmitted from point A to point B, you don't actually see it. That in itself is an exciting thing, to imagine how power is transformed from one form to another.

**ELECTRICAL ENGINEERING CAUGHT MY IMAGINATION BETTER THAN ANY OTHER FIELD OF ENGINEERING."**

And while some students worry that electrical engineering is harder than other disciplines, that's not the case. At Macquarie University, we help students with the maths and physics required, and there's a support system in place to help ensure students do well. So there's really nothing to be scared of.

I've been fortunate to mentor many students and love seeing them grow from first year through to final year. If you're looking for a career that can have a significant impact on the world – electrical engineering is it. Thanks to our shift to green energy, there's never been a better time to be an electrical engineer!

**Professor Aman Maung Than Oo, Dean, School of Engineering, Macquarie University**

BACHELOR OF ENGINEERING (HONOURS),  
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

MASTERS IN TELECOMMUNICATIONS  
ENGINEERING, ELECTRICAL ENGINEERING,  
UNIVERSITY OF MELBOURNE

LECTURER IN POWER SYSTEMS  
ENGINEERING, CENTRAL  
QUEENSLAND UNIVERSITY

PHD ELECTRICAL  
ENGINEERING,  
VICTORIA UNIVERSITY

DEAN AND HEAD OF  
SCHOOL OF ENGINEERING,  
DEAKIN UNIVERSITY

DEAN AND HEAD OF ENGINEERING,  
COMPUTER AND MATHEMATICAL SCIENCES,  
AUCKLAND UNIVERSITY OF TECHNOLOGY

DEAN, SCHOOL OF  
ENGINEERING,  
MACQUARIE UNIVERSITY

Check out [CareerswithSTEM.com](http://CareerswithSTEM.com) for more insights, information, inspiration and advice about electrical engineering careers!

SUPPLIED/SHUTTERSTOCK



# FULLY CHARGED

Jumpstart a career in electrical engineering to power up your future

**E**lectrical engineers quite literally run the world. They use their advanced maths and physics smarts to power our homes, classrooms, cities and satellites — designing and managing large and small-scale systems that transmit energy and process information.

There's an electrical engineer behind your household appliances, the phone calls you make, the shows you stream, lights you flick on, and even the future car you might drive.

And if you're already thinking about graduate opportunities — more power to you! Employers are actively seeking out electrical engineers skilled in mobile networking, satellite communications, renewable energy and microelectronics — in fields as diverse as

banking, telecommunications, defence, AI and health. And with salaries sitting higher than average — around the \$84K mark for grads three years in — it's a future-focused area that's seriously worth considering.

If uni is on your radar, look into a Bachelor of Engineering (Honours), and specialise from there! Or for double the employability consider a double degree in engineering + IT, environment or even law!

Macquarie University is a great place to jumpstart your search — with practical, hands-on courses in future energy, manufacturing, tech, research and hardware engineering.

## CURRENT VACANCIES

**WANT A CAREER THAT SPARKS SECURITY AND OPPORTUNITY? POP THESE JOB TITLES ON YOUR RADAR:**

- Electrical engineer
- Electronics engineer
- Computer hardware engineer
- Consultant
- Electronics designer or manufacturing engineer
- Environmental and sustainability designer or manufacturer
- Project and technology manager
- Research and development engineer

## How to get an engineering degree

So now you're sold on engineering, you'll need the lowdown on how to get the all-important degree

### Step 1: Stick with maths

It's a prerequisite for most engineering courses.

### Step 2: Nail that ATAR

Most universities require an ATAR of 80 or above for a Bachelor of Engineering, but you could always start out with a Diploma of Engineering, which requires an ATAR of 60 (see page 6).

### Step 3: Be ready for four years of study

The first couple you'll be learning the basics, and in the later years you'll choose your major (electrical of course!) and do an Honours year.

### Step 4: Be a star intern

To become a fully-fledged engineer you'll need Engineers Australia accreditation, which means doing a 60-day internship.

## SPARK NOTES

### STUDY

Bachelor of Engineering (Electrical and Electronic Engineering), Macquarie University

### EARN

From \$65K – \$122K

### WORK

Everywhere! Health companies like Cochlear, transport giants like Sydney Metro and Qantas or telecommunication employers such as Telstra and Aussie Broadband are just a start.



## Watt the?

Electrical engineers are up there with the most in-demand engineering jobs in Australia. We need 30,500 more by 2026!

In addition to a **Bachelor's degree**, many engineering employers require you to have a **Master's degree** or **PhD** in electrical engineering — yep, it's that specialised!

The money is good. **Electrical engineers are among the top 10 highest-paid engineers in Australia.**



## JOB GENERATOR

USE THE STEM + X FORMULA TO FIND YOUR FIELD

Electrical engineering + **Communication** = telecommunication design

Electrical engineering + **Environment** = renewable energy production

Electrical engineering + **Tech** = device maintenance and software development

Electrical engineering + **AI** = manufacturing and production

Electrical engineering + **Transport** = vehicle design and implementation

Electrical engineering + **Space** = product design and development

Electrical engineering + **Health** = engineering life-changing medical devices

## CIRCUIT SMARTS

GET SOME VOLTAGE IN YOUR VOCAB, WITH THE FOLLOWING FIRST-JOB PREREQUISITES:

### FLUENCY IN AUTOCAD, PYTHON, AUTODESK AND MATLAB

You'll need to be clued up in lengthy lists of software systems.

### PROJECT MANAGEMENT SKILLS

According to PayScale, the ability to lead a project has the biggest impact on an electrical engineer's salary!

### TEST ENGINEERING EXPERIENCE

Channel a test engineer's quality control capabilities. Troubleshooting devices — and entire networks — is all part of the gig!

### AUTOMATION KNOWLEDGE

AI is the future, right? And in electrical engineering it's all about simplifying systems in areas like device manufacturing, telecommunications, computer control and even energy production.

### CREATIVE FLAIR

You don't have to be a designer to enjoy a creative career! Electrical engineers spend 9 to 5 designing solutions to complex problems — and yep, technical drawing smarts help a lot.

### A MATHS MIND

An engineer + Year 11/12 maths = totally on-track! Take as many maths electives at school and uni as you can. Numbers are everything — particularly calculus!



# DESIGN YOUR OWN CAREER

DESPITE AN EARLY SETBACK, **SOPIA MAHMOOD** STUCK TO HER DREAM TO BECOME AN ENGINEER AND NOW GETS TO SEE HER ELECTRICAL ENGINEERING DESIGNS COME TO LIFE



**SOPIA MAHMOOD**  
UNDERGRADUATE  
ENGINEER, ARCADIS

When Sofia embarked on engineering study at Macquarie Uni she wasn't sure which major she would choose, but having gone with electrical engineering, she's now super excited to see her name on design drawings, and then see those designs come to life.

As an undergraduate engineer at consulting firm Arcadis, Sofia says she has worked on some pretty cool projects, like the Sydney Metro railway. As part of the rail team, she responds to design queries, undertakes software modelling and then designs drawings based on that modelling. She also works with engineers from other disciplines to deliver construction project designs for clients around Australia.

"My company also has an active graduate community who host monthly programs such as lunch-and-learns, Q&As with the senior leadership team and after-work events which I love to get involved in," Sofia says.

It wasn't an easy path to her current job though, as Sofia didn't get the required ATAR for the Bachelor of Engineering. Not wanting to forego her dream to become an engineer, Sofia

rejected other degree offers and instead enrolled in a Diploma of Engineering at Macquarie University as a pathway to an engineering degree. The diploma takes five terms to complete and when done you can start in the second year of a Bachelor of Engineering degree.

"If you have aspirations, never give up on trying for them and find alternate pathways that can take you there," Sofia says.

And keep your options open. "I have always wanted to be an engineer but I am also open to exploring my other passions and doing further study."

For now though, Sofia is sticking with electrical engineering. "Electrical engineering is such a vast field, where you can work on anything from rail to renewable energy and EV design."

**NEVER GIVE UP TRYING, AND FIND AN ALTERNATE PATHWAY THAT CAN TAKE YOU THERE**

UNDERGRADUATE ENGINEER,  
ARCADIS

SUMMER VACATION PROGRAM,  
ARCADIS

BACHELOR OF ENGINEERING (HONOURS)  
ELECTRICAL ENGINEERING, MACQUARIE UNIVERSITY

DIPLOMA OF ENGINEERING,  
MACQUARIE UNIVERSITY

DARANI AVE



# A day in the life of a... CIRCUIT BREAKER

**Sumiya Sultan** uses her electrical engineering skills to help healthcare businesses go green



**S**umiya Sultan is proof that an electrical engineering degree can take you anywhere — even to the health sector. The Macquarie Uni grad kickstarted her pathway with a Bachelor of Electronic Engineering, while throwing herself into loads of future-focused extra-curricular stuff.

“There was a lot of emphasis on student involvement and collaboration,” she says of her Macquarie Uni time. “It was a holistic experience and has shaped the person I am today.

During her degree, Sumiya jumped on anything that would give her bonus real-world experience in engineering and leadership — complimenting her studies and giving her the opportunity to travel while skilling up.

In her second year she put her hand up to be a volunteer at the Australasian Conference on Undergraduate Research, which led to her representing Australia at the Scholar

**I FELT FUTURE READY! IT WAS A DEGREE THAT OPENED DOORS”**

## Here's a typical day on the job for Sumiya:

**9am**

Scan through emails — there's always so much going on!

**10.30am**

Jump on calls with local healthcare providers and stakeholders. I'm the single point of contact between them so there's a lot of updating and reporting.

**12pm**

Lunchtime.

**1pm**

Check in with the healthcare facilities we're currently working with — part of my role is helping them achieve energy efficiency through smart building solutions.

**2.30pm**

Team brainstorm — we're always looking at new ways to grow Schneider in the health sector, so big ideas sessions are key.

**4pm**

Wrap up any urgent energy management projects for the day! I work across multiple business units so there are loads of stakeholders to update.

**5.30pm**

Log off — until tomorrow!

Laureate Program in Beijing. And in her spare time? Sumiya founded, launched and led Macquarie University's Women in Science and Engineering (WISE) society.

## TRANSFERABLE SPARK

These experiences, plus her electronic engineering coursework, gave her a valuable transferable skill-set — an asset to any future employer.

“I felt future ready!” Sumiya says. “It was a degree that opened doors.”

After graduating with first class Honours, Sumiya was hired by global energy management giant Schneider Electric (where she'd been interning), doing electrical engineering roles in customer projects, sales solutions, digital services and now healthcare.

Now? “I help healthcare facilities achieve energy efficiency and carbon reduction through smart and green building solutions,” Sumiya says of her next-gen engineering role.

BACHELOR OF ENGINEERING (HONS).  
ELECTRONIC ENGINEERING, MACQUARIE UNIVERSITY

ENGINEERING INTERN,  
SCHNEIDER ELECTRIC

CUSTOMER PROJECTS ENGINEER,  
SCHNEIDER ELECTRIC

SOLUTIONS ENGINEER,  
SCHNEIDER ELECTRONICS

DIGITAL SERVICES DEPLOYMENT LEADER,  
SCHNEIDER ELECTRIC

HEALTHCARE SEGMENT MANAGER,  
SCHNEIDER ELECTRIC



# Get the job!

Pumped to jumpstart a career in electrical engineering? Spark your interest further by loading up on fun, free resources

## Electives checklist

- ✓ Maths ✓ Physics
- ✓ Design Technology
- ✓ Digital Technology
- ✓ STEM

## GOOGLE

Step up your search history and pop these key terms into your browser

**Young Engineers Australia:** Attend an event and learn from students already studying engineering

**Florence McKenzie:** Australia's first female electrical engineer — inspiring!

**Careers with STEM:** Includes a hub of 100+ real-life engineering role models

**GradHack 2023:** A hackathon for recent engineering grads

## FOLLOW



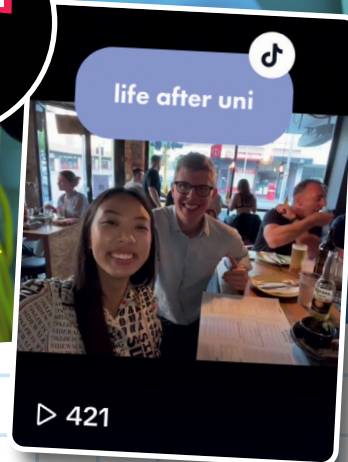
Yep, there's a current of electrical engineers showing off their jobs on TikTok! Check out the following feeds:

**@antisocial.army**

For fun 'day in the life' videos

**@placitech** For small-scale electrical engineering hacks you can try at home

**@stemgirltalk** For hilarious student in-jokes you'll wanna send to mates



## LINKEDIN

For high voltage career inspo, the CVs of these guys are up there:

### Orlando Hodgson

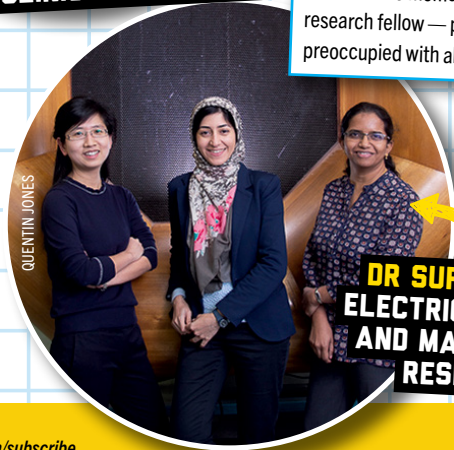
Macquarie University grad Orlando has peppered his career with electrical engineering jobs — including roles at Omron Electronics and Actron Air. And now? He's doing the clinical engineering thing in health.

### Dr Supriya Pillai

Dr Supriya Pillai is proof that electrical engineers can work in loads of different fields. At the moment she's a senior research fellow — primarily preoccupied with all things solar.



**ORLANDO HODGSON  
CLINICAL ENGINEER**

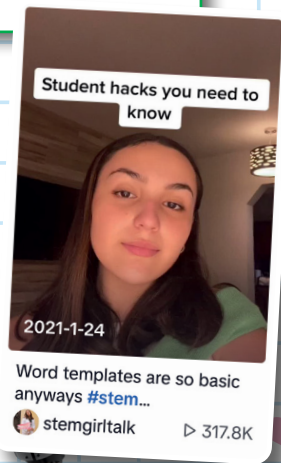


**DR SUPRIYA PILLAI  
ELECTRICAL ENGINEER  
AND MACQUARIE UNI  
RESEARCHER**

## JOIN THE CLUB

Loads of unis and TAFEs offer up extra-curricular clubs and societies where you can meet like-minded mates. At Macquarie Uni there are loads of options for electrical engineering enthusiasts, depending on your niche:

- Engineers without Borders
- Macquarie University Robotics Club
- Association of Computing Students
- Automotive Society
- Macquarie Machining Society



Word templates are so basic anyways #stem...  
stemgirltalk ▶ 317.8K

