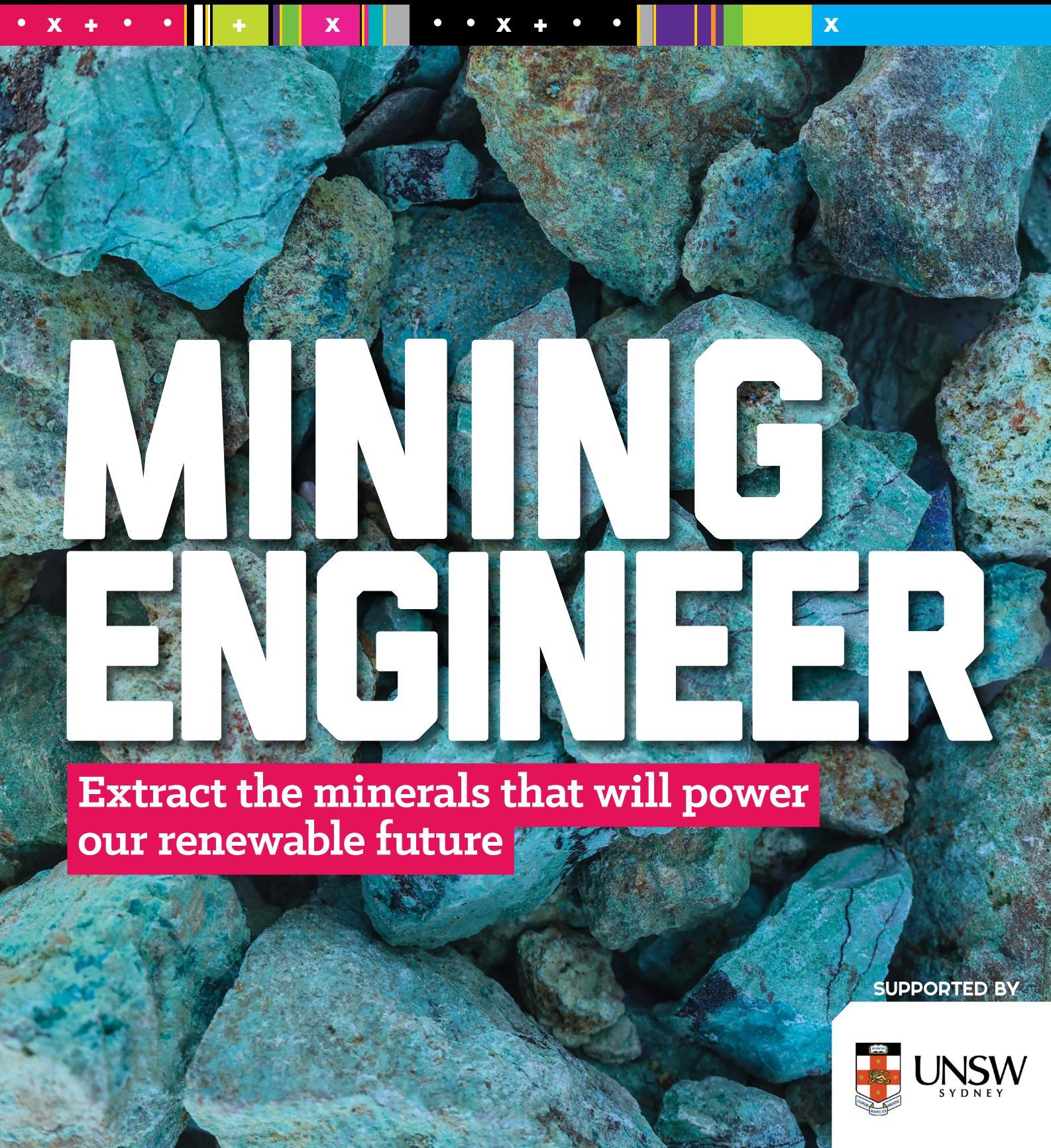


# CAREERS WITH STEM™ JOB KIT



## MINING ENGINEER

Extract the minerals that will power  
our renewable future

SUPPORTED BY



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UNSW Engineering

# Minerals and Energy Resources Engineering



**UNSW**  
SYDNEY

**ISMET CANABULET**  
HEAD OF SCHOOL, PROFESSOR  
UNSW SCHOOL OF MINERALS AND  
ENERGY RESOURCES ENGINEERING

FIND OUT MORE  
HERE OR SCAN:



# FUELING THE FUTURE

Mining engineering powers our sustainable future

**A**sk someone in the street about mining, and they might picture someone with a pick, digging for coal. But modern mining engineering is a cutting-edge career, critical for Australia's sustainable future.

There is a huge and growing demand for critical minerals to build the solar panels, wind turbines and batteries that will power the world into the future. To fuel that demand, we need to engage in more selective mining, with much less waste, much faster, and much more productively. And mining engineers will drive that change.

Engineers need to be able to plan, design, create, innovate and manage rapidly changing technologies, including big data and data analytics, artificial intelligence, robotics and automation. They need to be logical thinkers with strong reasoning skills and an understanding of sustainable mining practices.

Engineers also need to be able to work within multidisciplinary teams. They will work closely with mechanical engineers, electrical engineers and mine workers and lead development of new technologies.

From satellite monitoring, drone scanning, seismic and optic fibre data and Internet of Things networks, there's far too much information to comprehend.

UNSW Bachelor of Engineering (Honours) (Mining) students develop AI and machine learning tools and products to harness this information, and have access to virtual reality studios and 3D holographic tables to bring the data to life.

Mining engineering is not confined to Australia. The skills you gain can find you jobs all around the world, or even in space! UNSW already collaborates with NASA to explore the potential of mining water on the Moon.

Mining engineering offers an exciting, intellectually stimulating career in engineering, brimming with opportunities and challenges, and providing rewarding pathways and job security. If you like these, then mining engineering is for you.

**Professor Ismet Canabulet**  
Head of School, Minerals and Energy Resources Engineering, UNSW

**THE SKILLS YOU GAIN CAN FIND YOU JOBS ALL AROUND THE WORLD, OR EVEN IN SPACE!"**

BACHELOR OF SCIENCE (MINING ENGINEERING).  
ISTANBUL TECHNICAL UNIVERSITY

MASTER OF SCIENCE.  
MINING (ROCK) ENGINEERING.  
UNIVERSITY OF THE WITWATERSRAND

PHD. MINING (ROCK) ENGINEERING.  
UNIVERSITY OF PRETORIA

RESEARCH AREA MANAGER.  
CSIR MININGTEK

PRINCIPAL ENGINEER.  
STRATA ENGINEERING AUSTRALIA

PROFESSOR AND HEAD OF SCHOOL.  
MINERALS AND ENERGY RESOURCES ENGINEERING, UNSW

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

# Tunnel vision

Mining engineers are leading the clean energy revolution

## What is mining engineering?

Forget coal, dust, and hard hats – there's more to next-gen mining gigs than digging up dirt. Today's resource sector is full of high-tech engineering grads using drones, 3D modelling, artificial intelligence and self-driving trucks to find smarter, cleaner ways to power the planet. And nope, they don't spend all day underground.

These days, mining engineers work with a diverse team of experts – from data scientists and geologists to environmental specialists and safety teams – across high-tech labs, mine sites and digital control

centres. Whether they're designing future-ready mines or simulating how the ground will move decades from now, these tech-savvy thinkers are the brains (and still the hard hats) pushing the clean energy revolution forward.

And up there with one of their most important missions? Helping Australia (and the world) move towards net-zero carbon emissions. That means navigating how to safely mine critical minerals – think lithium, cobalt and rare earths – that power renewable technologies like solar panels, wind turbines and electric cars.

## TOOLKIT 2.0

### DRONES AND UAVS

Used for aerial surveys, mapping terrain, and monitoring mine sites remotely.

### 3D MODELLING AND SIMULATION SOFTWARE

Tools like Vulcan, Surpac or Leapfrog help engineers visualise underground ore bodies, model mine designs and test how land will respond to excavation.

### AUTOMATION AND ROBOTICS

From driverless haul trucks to automated drilling rigs, mining engineers design and manage systems that keep people out of dangerous zones and boost productivity.

### GPS AND REMOTE SENSING TECH

Satellite systems and remote sensors help track movement in the earth, measure environmental impact and keep operations safe and sustainable.

## WHERE WILL YOU WORK?

Graduate from UNSW's Bachelor of Engineering (Honours) in Mining and you'll have the skills to land a variety of mining gigs:

- Mining engineer
- Drill and blast engineer
- Mine planning engineer
- Production engineer
- Ventilation engineer
- Geotechnical engineer
- Surveyor
- Consulting engineer
- Financial and management consultant
- Tunneling engineer

### Show me the money

As a mining engineer, you will earn the top salary – "Mining Engineers top the nation's graduate salary rankings at **\$152,000** in their fifth year, surpassing professions such as general medicine (\$151,000), law (\$95,000), medicine (\$151,000), law (\$95,000), economics (\$93,000) and management and commerce (\$87,000)."

Engineers Australia,  
November 2025.

## Simply the best

UNSW ranks as the best mineral and mining school in Australia, and second in the world, according to **QS World Subject Rankings 2025**. At UNSW, you'll get hands-on experience and access to global research, industry placements and cutting-edge facilities.

## School of rock

Like most STEM pathways, mining engineering careers start with a passion for problem-solving, a love of innovating and a drive to make a difference.

A Bachelor of Mining Engineering (Honours) is an excellent way to skill up in a range of areas, including rock mechanics, geoscience, automation, and sustainability.

And if you're keen to really dig into your CV?

Putting your hand up for field trips, internships, networking opportunities and industry placements can boost your chances of securing a grad gig in your final year.

## MINING MYTHS. BUSTED

### “It’s all about coal.”

**Nope!** Australia's biggest opportunities now lie in critical minerals, such as lithium and rare earths, which are essential for clean energy and advanced technologies.

### “It’s dirty and dangerous.”

**No**, modern mining uses autonomous vehicles, drones, sensors, and AI to reduce risk and environmental impact. It's as much about data and tech as digging.

### “You’ll be stuck underground.”

**Not true.** Mining jobs are everywhere – on-site, in offices, labs and even remote operation centres in cities. You can design mine layouts, run simulations or optimise safety systems without stepping foot underground.

## Good job

If you're stressed about landing a role, don't be. With huge **government and industry investment in Australia's critical minerals sector**, employment opportunities are on the up – between now and 2030, the Australian mining and energy industry are expected to generate around **22,279 new jobs**.

## WHY CHOOSE MINING ENGINEERING?

 Solving problems is your thing

 You rate cutting-edge tech

 The idea of working all over Australia (and the world) excites you

 You're passionate about tackling climate change and are keen to make an impact

## SCHOLARSHIPS TO WATCH

- **UNSW MINERALS AND ENERGY RESOURCES ENGINEERING SCHOLARSHIP**
- **UNSW WOMEN IN ENGINEERING SCHOLARSHIP**
- **UNSW ENGINEERING RURAL SCHOLARSHIP**

FIND OUT MORE AT [SCHOLARSHIPS.UNSW.EDU.AU](http://SCHOLARSHIPS.UNSW.EDU.AU) OR SCAN



**THOMAS AQUILINA**  
MINING ENGINEERING  
STUDENT



GRADUATE  
AIC MINES



VACATION ENGINEER  
BENGALLA MINING COMPANY



BACHELOR OF ENGINEERING (HONOURS)  
MINING ENGINEERING (CO-OP) UNSW

# MINING MORE THAN MINERALS

UNSW UNDERGRAD **THOMAS AQUILINA** IS ENGINEERING HIMSELF A FUTURE-PROOF PATHWAY

In high school when Thomas Aquilina was career dreaming, one thing was for certain: a desk job was never going to cut it. “I was keen to do something in STEM,” he says. “But I was infatuated with the outdoors and didn’t like the idea of being stuck in an office.”

After a pathway-changing conversation with his grandad (a retired electrical engineer who had worked on mines in WA), Thomas started drilling down on STEM opportunities in the resource sector. “The idea of blowing stuff up as an engineer was – and still is – fascinating to me,” he admits. “[After our chat] I very quickly settled on mining engineering.”

## Uncovering opportunity

Fast forward a few years and assignments later, and Thomas is in his final year of a Bachelor of Mining Engineering at UNSW. From site visits to networking opportunities and even the chance to compete in the National Mining Games (twice!), he’s been able to pepper his time on campus with a string of extra-curricular opportunities.

And the same deal with the coursework, that covers industry-specific skills – from 3D modelling to stability analysis and scheduling optimisation. “The most fun (and challenging)

assignment has been the fourth year Feasibility and Design Project – where we are essentially tasked with designing a mine from scratch,” he says. “It’s where many students discover the roles they’d like to tackle in the future, and for me, it was drill and blast engineering.”

## Ground-breaking experience

Thriving in the practical nature of the degree, Thomas rates UNSW’s real-world approach and the fact that many of his lecturers have an on-site background grounded in field work. He’s been able to start creating industry connections, while developing practical, job-specific skills (from mining and geotechnical engineering to finance and project management), which has already led to an 11-month stint as a vacation engineer at Bengalla Mining Company and an upcoming graduate gig at strategic materials producer AIC Mines.

And what advice does he have for those considering similar pathways? “Get involved early and don’t be afraid to reach out to lecturers and industry representatives,” he says. “It’s an industry where your work becomes reality quickly. Seeing that impact is seriously rewarding.”

**YOUR WORK BECOMES  
REALITY QUICKLY™**

# Digging Deep

UNSW graduate Taylah Komacha found her dream job underground

Taylah Komacha and mining go way back. The third-generation miner grew up around the buzz of going underground, which made kickstarting a career in the resource industry a no-brainer.

"After doing work experience in mining engineering, it felt like the perfect fit for me," says the natural-born problem-solver. "I focused on STEM subjects from about Year 9."

After high school, Taylah enrolled in a Bachelor of Mining Engineering program at UNSW, where she took advantage of real-world opportunities outside the classroom. "I even ended up speaking on panels at NSW Mining careers dinners," she says. "It was a great way to meet industry professionals."

Now working at a coal mine in NSW, Taylah is hands-on every day. She's currently focused on learning the ropes in a new role, where her to-do list includes collaborating on mine plans, working closely with operations teams and spending time underground to understand processes firsthand.

And her advice to wannabe mining engineers? "Be open, be curious. Every role, challenge, or conversation is a chance to learn and grow in this industry."

**I REALLY ENJOYED THE PROBLEMS I GOT TO WORK ON, THEY WERE CHALLENGING AND COOL."**

WORDS: CASSIE STEEL | IMAGES: SUPPLIED / SHUTTERSTOCK

**BACHELOR OF MINING ENGINEERING (HONOURS), UNSW**



**CADET MINING ENGINEER, YANCOAL AUSTRALIA**



**GRADUATE MINING ENGINEER, YANCOAL AUSTRALIA**

**MINING ENGINEER, YANCOAL AUSTRALIA**



**MINING ENGINEER, DELTA COAL**

**TAYLAH KOMACHA**  
**MINING ENGINEER**  
**DELTA COAL**

## Day in the Life

**7am**

Arrive on-site and go through procedure, training and induction documents. "I've just started a new role and am learning the ropes!"

**8am**

Head underground to shadow staff and operations, looking mostly at ventilation and geological mapping.

**12pm**

Eat lunch and tackle my to-do list

**1pm**

Team meeting to brief everyone on the week or next day's tasks. "This ensures we're all up-to-date with the latest information on safety and productivity."

**2pm**

Continue to review site-specific procedures, operations and software. "I'm still trying to familiarise myself with the way of doing things in this new site!"

**3pm**

Finish any urgent tasks and organise notes for the following day. "I love heading into the office in the morning feeling organised."

# Get the job!

Get the dirt on next-gen mining careers



## WATCH

### Rare Earth Mining (YouTube)

Rare earths are the secret sauce behind phones, laptops and wind turbines – and right now, China digs up almost all of them. But scientists worldwide are on a mission to find cleaner, greener and even smarter ways to source or replace these super-materials of the future.

### Gold Rush (Discovery Channel)

Part oh-so-bad it's good reality show, part doco, this series follows modern-day miners on their quest to dig for riches.

### Aaron Witt (YouTube)

Who doesn't love videos of gigantic machines digging monumental holes?

## FOLLOW

### @mineralscouncilofaustralia (Instagram)

Career stalk recent grads to get a glimpse into local next-gen mining opportunities.



### @theminimgum (TikTok)

Run by a woman in mining – but not strictly engineering-focused – Tegan champions diversity in the resource sector and posts a mix of fieldwork and career advice for STEM-loving undergrads.



### @fifotok (TikTok)

Fun, short clips following real-deal fly-in-fly-out Aussie mining employees. Good for a late night scroll.



## PLAY

### Minecraft

Building, planning and resource management – it's basically a mini mining and engineering simulator.



### Deep Rock Galactic

A team-based first-person shooter where players (as space miners) drill for resources on alien planets. Not exactly realistic, but super fun and surprisingly strategic.



## LISTEN

### UNSW's Engineering The Future

From AI leaders to resource technologists, listen in on chats with Australia's biggest engineering brains. Our favourite ep? The one featuring UNSW Professor Ismet Canbulat who discusses the importance of mining as we move to a greener future.

### Engineering Heroes

Hosted by Engineers Australia, meet young Aussies working in engineering. Skip to season five, episode 10 for an insightful deep dive on mining gigs.

### Full Production with Peter Finn

Peter chats with some of the top minds in mining to talk news, innovation, and navigating a career in mining.

## GET INVOLVED

- Interested in connecting with other keen mining engineers? Hit up **AusIMM** for scholarship info, events, local meet-ups and mentorship opportunities.
- Like your meals with a side of career advice? Book a table at a **Mining NSW Mining Career Dinner**.