

CAREERS WITH STEM™



DESIGN ENGINEER

Insights, information and experiences
from careers in design engineering

SUPPORTED BY



Think STEM. Think QUT.

Studying STEM at QUT opens a world of opportunities to achieve your full potential and forge a rewarding career.

Discovering how to improve lives by solving a range of real-world problems will be crucial in the future. Many of the jobs of today were unheard of a decade ago: app developers, big data analysts, nanotechnologists and sustainability engineers.

We all know that careers in STEM provide the greatest opportunities to succeed in the future.

No university is better placed to help you launch your STEM career than Queensland's only university of technology.

Search QUT STEM to learn more about your study options, scholarship opportunities, and life as a QUT STEM scholar.

**the university
for the real world**



TAKE THE CHALLENGE

From designing race cars to solving the world's biggest climate problems, design engineers are an important part of the pit crew.

The world is getting more complicated and the problems we need to solve are only getting bigger. As both local and global needs develop and change, good design engineers will be more sought after than ever.

If you want to be part of the solution — think global warming, renewable energy and health — then design engineering may be for you.

Design engineering is team-focussed with groups from many different specialities working together, because no one problem can typically be solved by a single engineer.

The ability to work with people who aren't engineers, listen and learn from other industry experts — like tradespeople for instance — is also important. Combining that with the skills you learn during your university degree is what characterises a great design engineer.

Physics and maths are an important starting point if you're looking at electives, but more specifically, design engineers need to be interested in solving problems. So, if you've always liked coming up with designs that do things; enjoy tinkering in the backyard with the aim of inventing something to do a job; or coming up with designs that excite you, then design engineering is a great way to go.

At QUT we offer the opportunity for students to work on a practical level, learning for the real world. Like the internationally recognised Formula SAE (Society of Automotive Engineers) competition where students design, build and race an 80kW open-wheel electric race car against over 30 universities across Australasia. You'll design, build, learn and work with

DR DAVID HOLMES
SENIOR LECTURER,
MECHANICAL DESIGN
+ MANUFACTURING, QUT

ONE OF THE FOUNDING PRINCIPLES OF DESIGN ENGINEERING IS THAT YOU DESIGN SOMETHING THAT SOLVES A PROBLEM."

students across all engineering disciplines to take your solutions from a design to the track... at 120km/h.

There are also big blue-sky problems around renewable capture or generation of the energy and systems that utilise renewables. Because of these challenges, engineers are in high demand.

There are always jobs available with 83% of engineering graduates across Australia finding employment after uni. The engineering sector is expected to grow more than 30% in the next 10 years with design focussed engineers being a big part of that, so seek out opportunities to get involved. There are problem-solving design projects and robotics competitions at high school that can give you a taste for what to expect at uni. If you want to make a difference and be involved in solving the grand challenges of the world, the pathway is STEM.

David Holmes, Senior Lecturer Mechanical Design and Manufacturing, QUT

Check out CareerswithSTEM.com for more insights, information, inspiration and advice about a design engineer career!

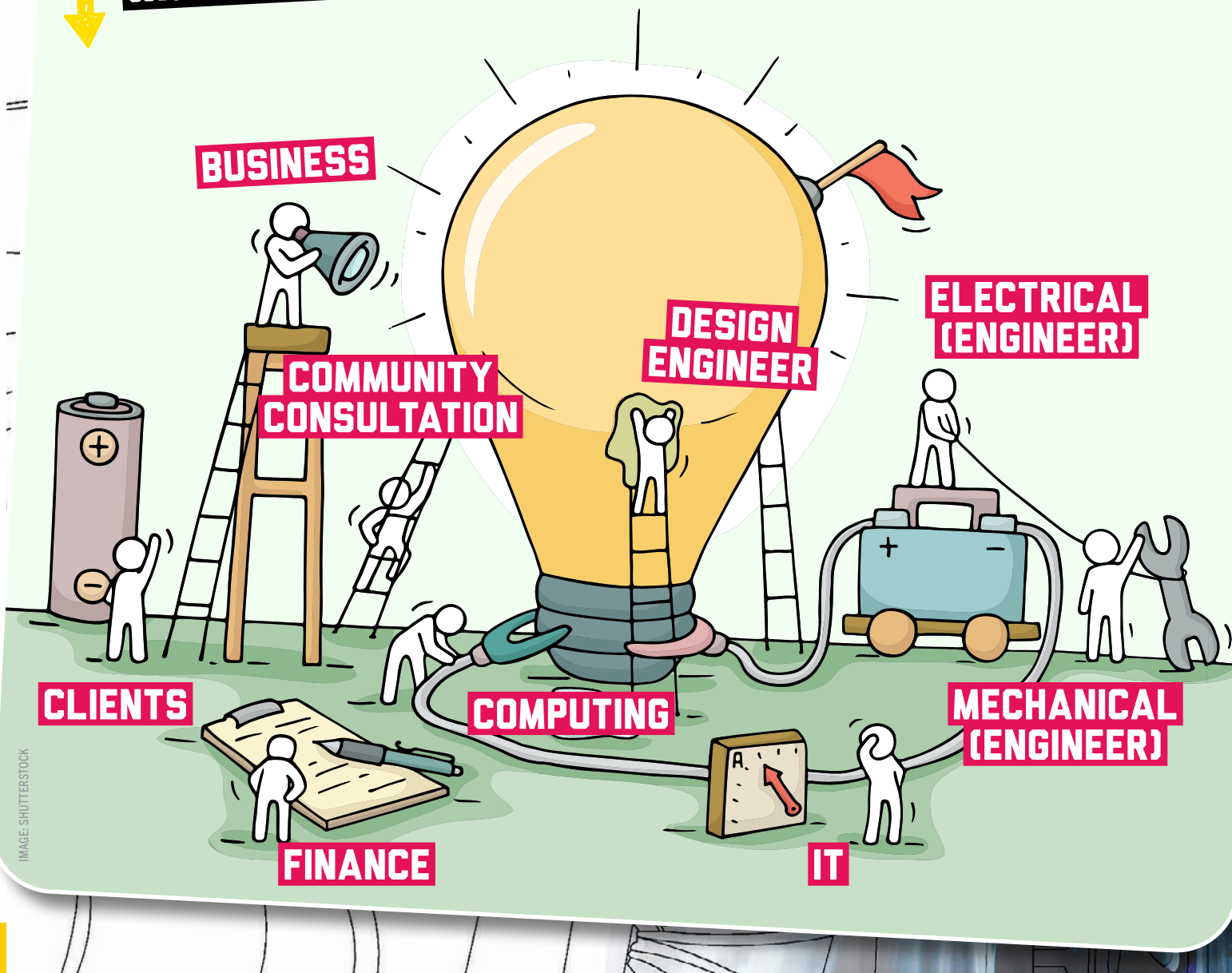
Diverse designing

Design is part of EVERY kind of engineering, so if you're an all-rounder who likes thinking creatively and working with lots of different people, start taking notes...

A design engineer is a problem solver, who produces some sort of a machine to solve the problem

TEAMWORK MAKES THE DREAM WORK

DESIGN ENGINEERS WORK WITH MANAGERS, MANUFACTURERS, CLIENTS AND CUSTOMERS, MACHINISTS, FABRICATORS AND A BUNCH OF OTHER ENGINEERING DISCIPLINES



WANT ADS

WHO ARE THE COMPANIES SIGNING A DESIGN ENGINEER'S PAY CHEQUE ATM?



DFR



Go big or go home

Lend Lease: Check out their work experience options and graduate programs.

Aecom Australia: They offer massive scope to make a difference for the future.

John Holland: With education and research projects always on the go there's plenty to learn on-the-job.

Industry leaders

Manufacturing: Boral, BP Australia, Amcor and Visy

Automotive: Everyone from Ford to BMW

Mining: BHP Group

Solar farming: Currently popping up everywhere. Government support behind farms like Limondale makes for good employment ops.

Domestic: Dyson. They've been engineering household solutions for nearly 40 years.

Consider the little guys

Startups and smaller boutique agencies are on the rise with new, different, interesting and diverse thinking where you can put your engineering skills to good use. (See page 8 for more.)



A GRAND CHALLENGE

Global warming, changing climate and ensuring food sources and safe drinking water are accessible for all, are just some of the grand challenges facing the world RN and every grand challenge becomes a design engineer's problem.

They're interesting problems, sure, but they'll also be problems we can't even anticipate yet. So, the National Academy of Engineering out of the US — along with a bunch of international engineering friends — have defined 14 Grand Challenges for Engineering. From solar and cyber space, to health and infrastructure find where you could make a difference in your engineering future: engineeringchallenges.org

PAY GRADE

You can earn some big bucks straight outta uni in the design engineering field!

\$74,000
per year on average

Skills that pay the bills

- ✓ Problem solving
- ✓ Teamwork
- ✓ Listening
- ✓ Balancing expectations
- ✓ Analytical thinking
- ✓ Creative thinking

*SOURCE: SALARY ACCORDING TO PAYSACLE.COM

MANUFACTURING POSSIBILITIES

ENGINEERING CONSULTANT SHAY CHALMERS KNOWS A THING OR TWO ABOUT HOW TO DESIGN THINGS FOR MASS PRODUCTION

**SHAY CHALMERS
STRATEGIC ENGINEER**



Shay Chalmers became an engineer so she could solve the world's problems. After her little sister became one of the first people to receive a Cochlear implant, Shay wanted to study medical engineering. Except she didn't get in, so she studied mechanical engineering instead.

"I'm so glad I did mechanical," she says. "It's really broad. The broader you go with engineering, the more career opportunities you have. And that's why I've had such a broad range of experiences."

Shay's studies led her to a career in manufacturing, and she's since worked with everything from batteries to medical devices and even chocolate. One of her early roles working in a US steel mill during the Global Financial Crisis in 2008 cemented her passion for manufacturing.

"Seeing a lot of my guys losing their jobs and the impact that had on the community really solidified my love for manufacturing," Shay says. "It made me passionate about keeping it alive in Australia."

In 2017 Shay launched a company, Strategic Engineering Australia, where she helps companies set up their own

IF YOU'RE UP FOR A CHALLENGE AND LIKE PROBLEM SOLVING, IT'S A FUN CAREER!"

manufacturing facilities. She is also a partner with Ontogo, which helps health technology companies commercialise their products. As a result, she works with a lot of design engineers and knows their blind spots.

"You have to think about products holistically," she says. A good design engineer thinks about the end user, but it's also important to think about how easy the product is to manufacture and sell. "People often say they can't find a manufacturer, but often the problem is that manufacturing their product is not feasible."

Every day is different for Shay. She might be doing a site visit, writing a risk analysis report, talking to suppliers or reading about new technology. "If you're up for a challenge and like problem solving, engineering is a really fun career!"

– Chloe Walker

**BACHELOR OF ENGINEERING
(MECHANICAL). QUT**

**PROCESS ENGINEER.
SEVERSTAL NA**

**MASTER OF ENGINEERING
MANAGEMENT. QUT**

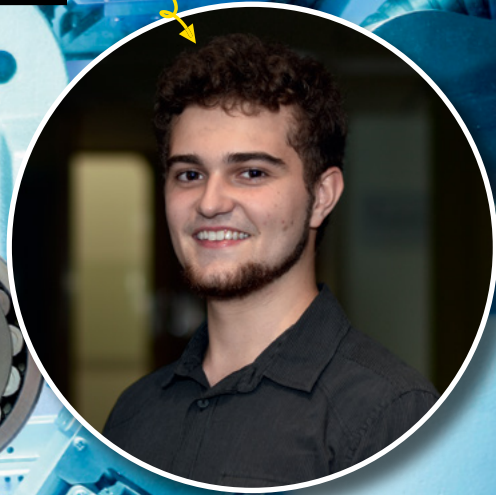
**PROJECT MANAGER.
COOK MEDICAL**

**PARTNER.
ONTOGO**

**OWNER AND DIRECTOR.
STRATEGIC ENGINEERING AUSTRALIA**

KNOW YOUR PRODUCT

Flynn Schrantz discovered industrial design through a graphics teacher who had worked in industry



UNDERGRADUATE MECHANICAL ENGINEER, OLITEK

Flynn Schrantz is in his third year of the five-year industrial design and engineering double degree at QUT. He gave us the lowdown on the course and how he landed a great job at an engineering firm before finishing his degree.

HOW DID YOU GET INTERESTED IN INDUSTRIAL DESIGN?

I always liked graphics and design at high school and I wanted to do product design. But that's not something you can go out and study. Then in Year 11 we had a new graphics teacher who had studied industrial design. I thought industrial design was all about valves and conveyor belts, but when he started telling me about it, I realised it was exactly what I wanted to do!

AND WHAT ABOUT MECHANICAL ENGINEERING?

They complement each other really well. Mechanical engineering is the most open-ended discipline in engineering. It deals a lot with moving parts and things like that. That's really helpful for design, where you're making things for people to use.

"I LIKE THAT I GET TO DO HANDS-ON WORK!"

HAS THE COURSE LIVED UP TO YOUR EXPECTATIONS SO FAR?

It's better! I still wasn't sure exactly what industrial design entailed when I started, and it's been eye-opening. I've worked on graphical user interfaces and learned about ergonomics and usability. This semester we're working with an Arduino circuit board. The last project I did was designing a lamp in the style of a movie. I'd never thought of doing anything like that before, but it was a good exercise in hand shape and movement and how people actually use products.

HOW DID YOU GET YOUR JOB AT OLITEK, AND WHAT DO YOU DO THERE?

I went to an online networking event run by the QUT Mechanical Engineering Student Society and got talking to the CEO of Olitek. Afterwards I contacted him by email, and eventually he offered me a job. Olitek is an R&D firm and I'm working on a robotic mining project. I do a lot of the documentation and help out with testing. I like that I get to do hands-on work!

STEM AMBASSADOR, QUT

BACHELOR OF DESIGN (INDUSTRIAL DESIGN)/BACHELOR OF ENGINEERING (HONOURS) (MECHANICAL ENGINEERING), QUT

Get the job!

Tips to help score the design engineering gig you want

THE RIGHT FORMULA

At QUT you learn “in real life”. Practical experience through initiatives such as the Formula SA (Society of Automotive Engineers) allow undergrads to participate in global comps, building race cars from scratch to ultimately drive on a track – at speed – and get some know-how designing and solving problems in real time.

Design is a process, from blank sheet to a manufactured product. But it can't be learnt just in lectures. So get involved in graduate and post-graduate opportunities and rack up that IRL experience. It'll look good on any resume.



SOCIAL CONNECTIONS

Throw a follow at these excellent engineering resources for the funny and the informative!

YouTube

NASA TV [youtube.com/c/NASA](https://www.youtube.com/c/NASA)

Insta

@engineering_made_easy

Twitter

#DEC Design...Engineer...Construct!
@DECinSchools

TikTok

#designengineer #engineering



in

SIGN UP

• Hit up **LinkedIn** for engineering internships and score an opportunity to hone your skills at places like the **CSIRO** and **Canva**.

• **Join a club and volunteer.** QUT offers the opportunity to be part of the campus Engineers Without Borders club, so you get a bucket load of experience while doing a bunch of good!

• Read all about your design engineering options at **CareerswithSTEM.com** from the peeps in the industry.



Electives checklist

Choosing high school electives? These subjects will set you up for a career as a design engineer:

- ✓ Physics
- ✓ Industrial design
- ✓ Environmental Science
- ✓ Design & Technology
- ✓ Maths

Choose this career if you...

- > Like challenges
- > Are creative
- > Are detail-oriented
- > Like seeing your work in the real world

BOOKMARK THIS!

Engineers Australia offers courses, info, hook ups and up-to-date industry news for emerging engineers in our country. There's a wealth of knowledge at the click of your keypad and if you're the entrepreneurial type with a top idea they offer events and advice to help get your startup going.

bit.ly/EngStartUp

