Exciting jobs for you now and in the future.

If you are passionate about science, technology, engineering, arts (design) and mathematics (STEAM), consider a career in

manufacturing and engineering

gateway to industry schools

manufacturing and engineering

Contents

In 2017 manufacturing was the fifth largest contributor to the Queensland economy, employing over 165,000 people.

Times are changing and a new wave of digitisation and automation, otherwise referred to as Industry 4.0, will significantly transform the manufacturing industry.

Manufacturers will work smarter not harder and this will open up a range of new career opportunities, some of which may not even be currently recognised in the industry.

How to use this guide to find a career in manufacturing and engineering

This guide highlights some of the career opportunities that exist within this diverse industry. It only contains a snapshot of the careers that exist now and in the future.

Use this guide in conjunction with online resources for more information on specific roles. As you search for the perfect career for you, take note of the education pathway required. Each pathway is colour coded to make it easy to follow.

All of the following roles require STEAM focus

Education pathway:

Vocational (VET)

Higher Education (HE)

VET and HE

Vocational (VET)

Higher Education (HE)

VET and HE

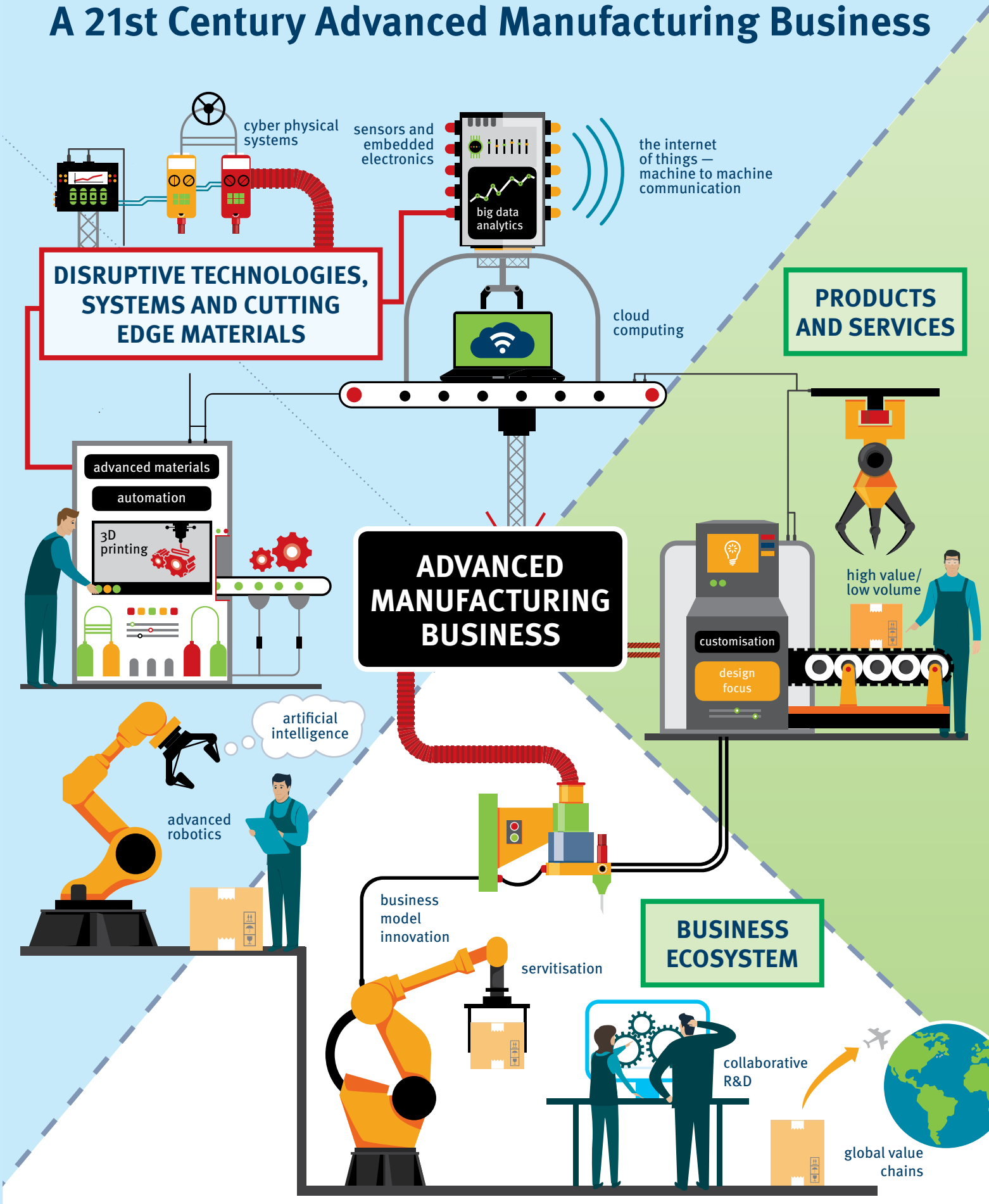
Roles in manufacturing you may already know

- Factory process worker
- Machine technician
- Plastics and polymer process worker
- Production clerk
- Order clerk
- Production officer
- Sales representative
- Stock clerk
- Storeperson
- Finance officer
- Quality assurance (QA)/ product assembler
- Quality assurance (QA)/product grader
- Quality assurance (QA)/product tester
- Warehouse administrator
- Forklift driver
- Instrumentation engineer
- Quality assurance (QA)/ production manager
- Fitter
- Fitter and turner
- Fitter-welder
- Metal fabricator
- Sheetmetal trades welder
- Engineering manager
- Machine operator including computer controlled machines (known as CNC)
- Manufacturer
- Supply and distribution
- Electrical engineer
- Mechanical engineer
- Industrial designer
- Quality assurance (QA)/ product examiner
- Industrial design
- Prototyper
- Industrial engineer

A change to the manufacturing industry is coming through Industry 4.0. It will be driven by three main drivers:

- The Internet of Things (IoT) (System of physical things embedded with sensors, software, electronics and connectivity to allow it to perform better by exchanging information with other connected devices, the operator or the manufacturer)
- Big Data and Cloud Computing (Capturing more data from sensors can lead to better manufacturing processes)
- Robotics and Artificial Intelligence (This includes smart machines, digital assistants and autonomous devices)

A 21st Century Advanced Manufacturing Business



Vocational (VET)

Higher Education (HE)

VET and HE

Advanced manufacturing roles and the future

Advanced manufacturers design and use new technologies and innovative production systems to produce high-value products and smart services across key industry sectors.

Find these roles in any of the following industries.

- Additive designer
- Additive technician
- Advanced fibre, carbon fibre and composite technician
- Lean / six sigma / trim / good manufacturing practice technician
- Product manager - internet of things
- Strategy manager - digitisation
- Artificial intelligence engineer
- Artificial intelligence scientist
- Coding and robotics engineer
- Cyber-physical engineer
- Mechatronic engineer
- Mechatronic designer
- Remote engineering mechantronics and robotics engineer
- Remote engineering mechantronics and robotics technician
- Additive engineer
- Advanced fibre, carbon fibre and composite engineer
- Drone/UAV design and development engineers
- Applications software engineer - manufacturing
- Big data analysts
- Data engineer
- Big data scientists
- Electrical / automation engineer - manufacturing
- Environmental scientist / engineer
- Hardware / electronics engineer
- Industrial data scientist
- Industrial user interface (UI)/ user experience (UX) designer
- Industrial UI / UX engineer
- Lean / six sigma / trim / good manufacturing practice: engineer
- Software development test engineer
- Systems engineer
- Artificial intelligence programmer
- Robot coordinator
- Drone/unmanned aerial vehicle (UAV) repair technician
- Drone/unmanned aerial vehicle (UAV) software developers
- Drone/unmanned aerial vehicle (UAV) technicians
- Unmanned aerial systems maintenace technician/operator
- Unmanned aircraft systems program management
- Unmanned systems engineer
- Industrial computer engineer / programmer
- IT / internet of things solutions architect
- Quality assurance manager
- Software engineer cloud, internet of things, specialist cost auditer
- Specialist managers

Vocational (VET)

Higher Education (HE)

VET and HE

Aerospace

Aerospace is the technology and support systems that enables flight of all civil and military aircraft—aeroplanes, helicopters and remotely piloted aircraft. It includes the design, development, manufacture, modification, testing, operation and maintenance of flight vehicles and their on-board and ground systems.

Also see advanced manufacturing roles as they also exist in this industry.

- Engineering production systems worker
- Industrial spraypainter
- Metal engineering process workers
- Metal fitters and machinists
- Metal machinist - first class
- Sand blaster
- Aeronautical engineer
- Aerospace engineer
- Aircraft maintenance engineer *(avionics)*
- Aircraft maintenance engineer *(mechanical)*
- Aircraft maintenance engineer *(structures)*

Did you know that a 747-400 passenger airliner has a jaw-dropping six million parts? Which explains why aircraft engineers are in demand!

Vocational (VET)

Higher Education (HE)

VET and HE

The Joint Strike Fighter or F-35, is a cutting edge combat aircraft manufactured using the most-up-to date technology. Queensland businesses are supplying parts to these aircraft which will be used by air forces around the world.

Defence

Investment in defence technology has advanced fields like nanotech, communications, electronics and precision manufacturing as well as the automotive, marine and aerospace sectors. A $195 billion investment over the next decade will create demand across a range of STEM fields.

Also see advanced manufacturing roles as they also exist in these industries.

Plastics, rubber and cablemaking

- Plastic cablemaking machine operator
- Plastic compounding-reclamation machine operator
- Plastics and rubber production
- Plastics fabricator or welder
- Plastics factory worker
- Plastics production machine operator
- Reinforced plastic and composite production worker
- Rubber factory worker

Marine

- Boat builder
- Engineering production systems worker
- Industrial spraypainter
- Marine transport professionals
- Metal engineering process workers
- Metal fitters and machinists
- Metal machinist - first class
- Sand blaster
- Ship's officer
- Ship's surveyor
- Shipwright

Automotive and transport

- Fitter
- Fitter & turner
- Fitter-welder
- Machine operator
- Mechanical engineering draftsperson
- Mechanical engineering technician
- Metal engineering process workers
- Metal fabricator
- Production or plant engineer
- Sheetmetal trades worker
- Stationary plant operators
- Vehicle body builder
- Vehicle trimmer
- Engineering manager
- Industrial engineer
- Mechanical engineer

Vocational (VET)

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Industrial biotechnology and bio products

The industrial biotechnology and bio products sector focuses on the manufacture of products from sustainable organic and/or waste resources into a diverse range of bioproducts. This includes sustainable chemicals, fuels, synthetic rubber, cosmetics, detergents and textiles. Innovative scientific and industrial technologies create bioproducts which are renewable and provide environmentally beneficial alternatives to existing conventional chemical and fossil fuel refining processes.

Also see advanced manufacturing roles as they also exist in these industries.

Many waste products can be turned into bioproducts – fuels, chemicals and plastics which can all be produced using crops such as sugar cane trash, animal waste and household waste.

- Bulk materials handling plant operator
- Chemical engineer
- Chemical plant operator
- Chemical plant worker
- Chemical production machine operator
- Chemist
- Biomedical engineer
- Environmental manager
- Materials engineer
- Biomechanical engineer
- Molecular engineer
- Nanotechnology engineer

- Nanotechnology scientist
- Power generation plant operator
- Gas or liquid fuel operator
- Laboratory manager

Vocational (VET)

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Biomedical

Australia is recognised for its development of medical innovations. The cochlear implant is an example of an Australian manufactured medical device. Today, Australia is ranked fifth in the world for its biotechnology innovation potential and it is predicted that by 2026 there will be close to 12,420 jobs available in the biomedical industry, worth a whopping $1.9B.

Also see advanced manufacturing roles as they also exist in these industries.

Laboratories and pharmaceuticals

- Chemical production machine operator
- Chemist
- Industrial engineer

Medical and surgical equipment

- Engineering production systems worker
- Machine operator
- Metal machinist - first class
- Metal fabricator
- Sand blaster
- Sterilisation technician
- Dental prosthetist
- Dental technician

Did you know the Gardasil vaccination was created right here in Queensland and is used worldwide to massively reduce the prevalence of human papilloma virus (HPV)?

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Mining equipment, technology and services (METS)

Queensland has internationally recognised expertise across the mining equipment, technology and services sector and in the manufacture of specialised mining and mineral processing equipment. As automation becomes more prevalent in the resources sector there will be increasing demand for this expertise.

Also see advanced manufacturing roles as they also exist in these industries.

A Queensland company, NLT Australia, has developed the world's first wifi technology that can be used safely in mining operations. The METS sector is about providing advanced technologies and techniques to make mining and gas operations safer and more efficient.

Electric and electronic

- Machine operator
- Power generation plant operator
- Electrician
- Electrical engineering draftsman
- Electronic engineering draftsperson
- Electronics engineer
- Electrical engineer

Engineering mechanical and fabrication

- Metal engineering process workers
- Metal fitters and machinists
- Metal machinist - first class
- Pressure welder
- Sand blaster
- Toolmaker
- Welder - first class
- Mechanical engineer draftsperson
- Engineering production systems worker
- Industrial spraypainter
- Lift/conveyor belt mechanic
- Production manager
- Laboratory manager
- Engineering professionals
- Engineering technologist
- Engineering patternmaker
- Production or plant engineer

Vocational (VET)

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Precision agriculture

The growing demand for smart farming that includes precision agriculture (through robotics and automative technologies contributing to more efficient agricultural practices) and telemetry devices (needed to operate farming enterprises remotely), will create robust opportunities for businesses within Queensland's highly productive agricultural industry. There are also opportunities in the agricultural sector for the design and manufacture of biodegradable starch-based plastics and composites through cleaner processes and easier recycling.

Also see advanced manufacturing roles as they also exist in these industries.

The data gathered from using drones in farming can show farmers which crops are healthy and which crops are weak, helping them make necessary adjustments to create greater efficiency and save money.

Engineering mechanical and fabrication

- Metal engineering process workers
- Metal fitters and machinists
- Metal machinist - first class
- Pressure welder
- Sand blaster
- Toolmaker
- Welder - first class
- Mechanical engineer draftsperson
- Engineering production systems worker
- Industrial spraypainter
- Lift/conveyor belt mechanic
- Engineering patternmaker
- Production or plant engineer
- Engineering professionals
- Engineering technologist
- Production manager (mining)

Renewable energy

- Electrician and commercial solar installer
- Solar labourer / trades assistant
- Power generation plant operator
- Biofuels plant operators
- Environmental scientists
- Power systems engineer (wind and solar)
- Renewable energy engineer
- Renewable power systems engineer
- Solar engineer
- Design manager - renewable energy projects
- Biofuels engineers
- Biofuels technologist
- Energy efficiency project officer

Vocational (VET)

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Furnishings

Furnishing covers a diverse array of sectors including furniture and furnishings, kitchens, cabinets, glass, furnishing design, windows, doors, flooring and picture framing.

- Cabinetmaker
- Fabric and textile factory worker
- Furniture finisher
- Hide and skin processing worker
- Industrial spraypainter
- Picture framer
- Upholsterer
- Wood and wood products factory worker
- Wood machinist
- Wood machinists and other wood trades workers
- Wood processing machine operator
- Wood turner
- Industrial designer

Construction manufacturing

Don't forget to also check out the advanced manufacturing roles on page 5 which are also found in all of these industries. Construction manufacturing commonly refers to manufacturing using materials such as glass, stone, and non-metallic mineral products like ceramic and clay.

- Cement and concrete plant worker
- Cement production plant operator
- Chemical production machine operator
- Clay processing factory worker
- Clay products machine operator
- Clay-concrete-glass-stone machine operator
- Concrete batching plant operator
- Concrete products machine operator
- Concrete pump operator
- Glass processing worker
- Glass production machine operator
- Glazier
- Stone processing machine operator

Vocational (VET)

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Food and beverage processing

Queensland's food and beverage industry ranges from producers of fresh, natural and organic products to producers of manufactured foods, such as ready-made meals, confectionery, additives and nutritional supplements.

Also see advanced manufacturing roles as they also exist in this industry.

- Baker
- Food and drink factory workers
- Food trades assistants
- Manufacturer
- Meat boner and slicer
- Meat process worker
- Packers
- Pastrycook
- Pastrycook's assistant
- Poultry process worker
- Seafood process worker
- Slaughterer
- Chemist
- Food technologist
- Wine maker
- Industrial engineer

Australian egg producer, Sunny Queen has established a world-first production facility in Queensland. The plant is the only one of its kind that can produce 1,100 tonnes of egg-based products per annum for delivery Australia wide.

Vocational (VET)

Higher Education (HE)

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Creative manufacturing roles

Creative industries are a sub-sector of the manufacturing industry. These industries inspire design in manufacturing and are key to driving innovation and sustainability.

Printing and graphic arts

- Binder and finisher
- Digital printer / press operator
- Graphic pre-press operator
- Offset printer
- Paper products machine operator
- Print finisher
- Printers assistant
- Printing machinist
- Printing table worker
- Screen printer
- Signwriter
- Small offset printer
- Manager – production (including digital)
- Nano designer
- Three dimensional designer
- Digital graphic artist
- Graphic artist
- Manager – business development, sales and marketing
- Nano printer

Textile, clothing and footwear

- Fabric and textile factory worker
- Footwear factory worker
- Footwear production machine operator
- Hide and skin processing worker
- Knitting machine operator
- Leather goods maker
- Manufacturer
- Sail maker
- Sewing machinist
- Shoemaker
- Textile and footwear production machine operators
- Textile, clothing and footwear mechanic
- Textile, dyeing and finishing machine operator
- Weaving machine operator
- Yarn carding and spinning machine operator
- Fashion designer
- Apparel cutter
- Canvas goods maker
- Clothing patternmaker
- Clothing trades worker

Artisan/heritage

- Engraver
- Gunsmith
- Locksmith
- Musical instrument maker
- Optical mechanic
- Precision instrument maker and repairer
- Saw maker and repairer
- Watch and clock maker and repairer
- Cooper and blacksmith
- Jeweler
- Jewelery designer

What's next?

1. Now you know some of the careers that are available, go to joboutlook.gov.au and do the career quiz
2. Identify your industry of interest
3. Choose a role of interest and note the education stream, i.e. VET or Higher Education
4. Check out the future of the role at www.skillsgateway.training.qld.gov.au or speak to your careers counsellor
5. Doing well at science, technology, engineering, art (design) or maths and enjoy making things? Check out careers information at www.education.gov.au/career-education-resources
6. Start your career by finding out if there are opportunities across the manufacturing and engineering industries through the Gateway to Industry Schools Program. https://training.qld.gov.au/employers/gatewayschools

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Queensland Government

www.training.qld.gov.au

Disclaimer: This resource is delivered in good faith that the information provided is true and correct at the time of publication 2018. This publication provides a snippet of roles in manufacturing and engineering and doesn't in any way show the depth and breadth of opportunities in each industry. This tool is to inform students, parents, teachers and careers advisors about possible pathways to these industries.

Industry Partners:

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