



MONASH
University

MONASH
MECHANICAL
ENGINEERING

[monash.edu/engineering/
mechanical](http://monash.edu/engineering/mechanical)



WHAT IS MECHANICAL ENGINEERING?

Mechanical engineering is the basis for the design and operation of mechanisms – from the simplest pulley to the most highly-tuned machines such as gas turbines, high speed trains and robotic surgeons.

Mechanical engineering is about the efficient use of energy for practical purposes. Mechanical engineers build on fundamental science – physics, chemistry, materials science, mathematics, and increasingly biology – to achieve this goal. They must understand the generation, conversion, transmission and use of mechanical forces and thermal energy. They also need to understand the behaviour of fluids, structures and the interaction of parts in motion.

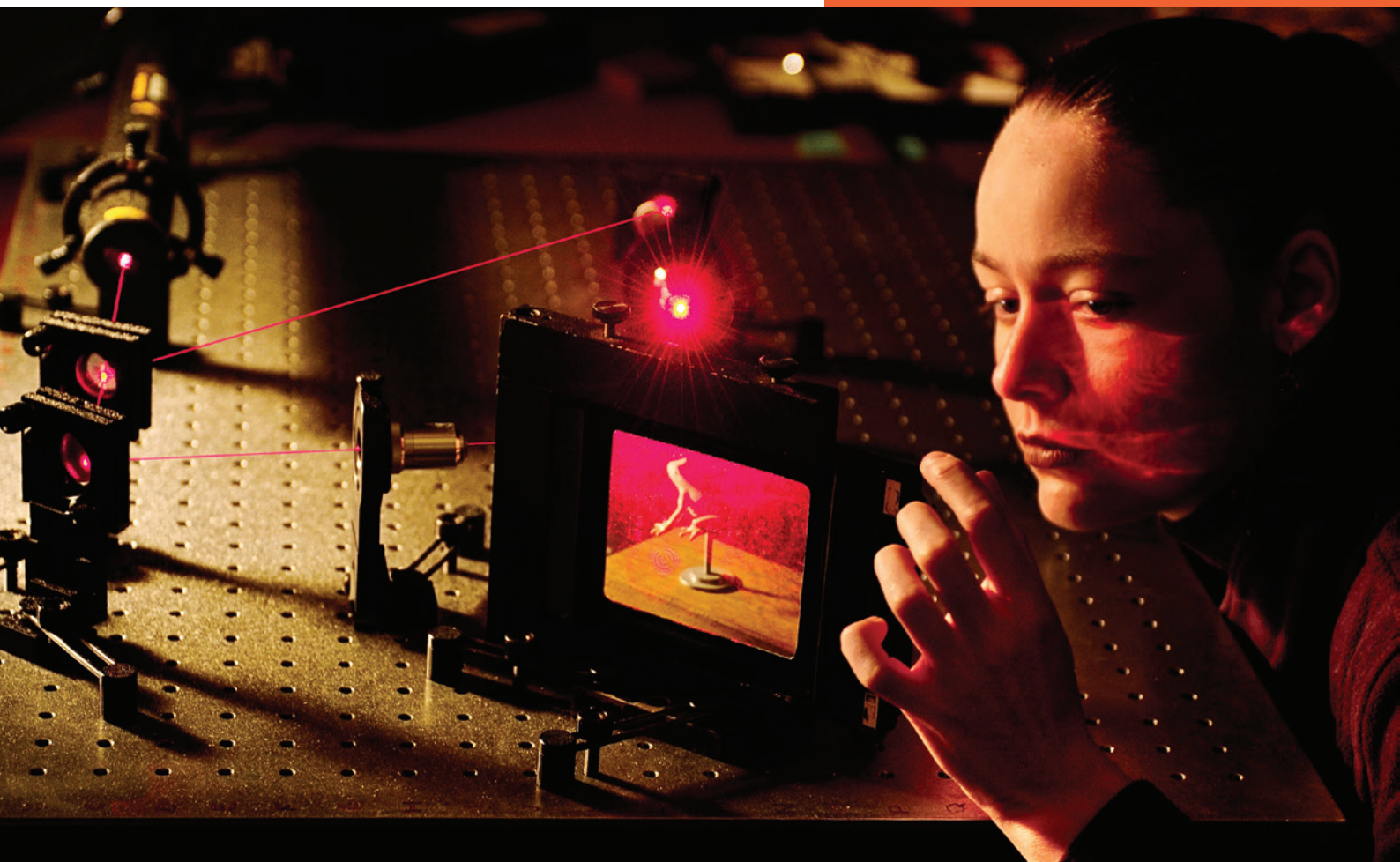
WHAT DO MECHANICAL ENGINEERS DO?

Mechanical engineers work on power plants, renewable energy systems, electrical generators, robots, propulsion systems, computer systems, climate control systems, engine cooling, respiratory and air conditioning systems, aircraft engines and cars.

Mechanical engineers design devices to optimise the use of material and minimise failure. They efficiently control and maintain systems to operate plant and equipment reliably over many years.

A mechanical engineer might design wind or marine turbines for renewable energy generation, smart buildings, highly efficient low cost products for the developing world, robots and automatic control systems, advanced structures for space travel, or optimise the aerodynamics of trucks and trains.

Mechanical engineers are increasingly engaged in the design and operation of devices that require skills that cross traditional discipline boundaries. Examples include bespoke 3-D printed medical devices and prosthetics made for an individual surgeon or patient, noise and vibration control, medical imaging and robotic surgery, high performance composite materials, advanced manufacturing, and pollution control.



CAREERS IN MECHANICAL ENGINEERING

YOUR GLOBALLY RECOGNISED COURSE COULD SEE YOU WORKING IN MANY SPECIALIST AREAS INCLUDING:

BUILDING SYSTEMS DESIGN

PRODUCT AND PROCESS DESIGN

ADVANCED MANUFACTURING

RESEARCH AND DEVELOPMENT

MEDICAL ENGINEERING

3D PRINTING

COMPUTATIONAL ANALYSIS

TECHNICAL SALES AND SUPPORT

FIELD AND TEST ENGINEERING

PROJECT MANAGEMENT

QUALITY CONTROL

INDUSTRIES EMPLOYING MECHANICAL ENGINEERS INCLUDE:

PETROCHEMICAL MANUFACTURING

TRANSPORTATION

AUTOMOTIVE

ANIMATRONICS

LOGISTICS

IMAGING

AEROSPACE

ELECTRONICS

MINING

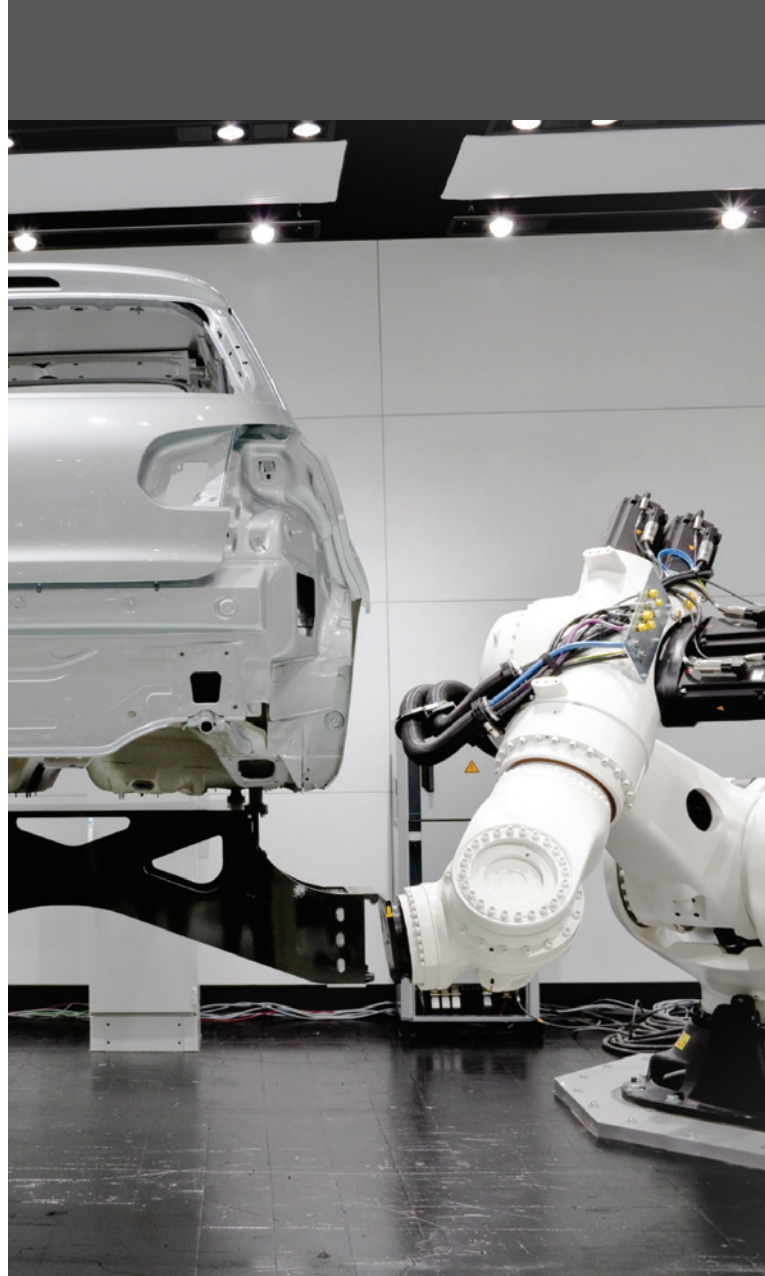
ROBOTICS

BANKING

CONSULTING

MEDICAL DEVICES

DEFENCE



AS A MECHANICAL ENGINEER YOU WILL DISCOVER COUNTLESS GROWTH SECTORS THAT YOU CAN PARTICIPATE IN. OPPORTUNITIES FOR MECHANICAL ENGINEERS IN AUSTRALIA AND OVERSEAS ARE EXTENSIVE.

MECHANICAL ENGINEERING AT MONASH

THE DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

The Department of Mechanical and Aerospace Engineering is globally renowned for its teaching, its research and its facilities. It is the largest department in the Faculty of Engineering with a dynamic academic, postgraduate and postdoctoral community. Undergraduate students regularly interact with postgraduates and postdoctoral researchers.

Our researchers perform innovative work in exciting and globally relevant areas – including micro-nano devices, robotics, biomedical devices, materials design, advanced manufacturing, aerodynamics, energy, structural monitoring, wind engineering, and the latest in biomedical imaging. This research is shared with undergraduates in the classroom.

MONASH MOTORSPORT FORMULA SAE: DESIGN, BUILD, COMPETE

Established in 2000, Monash Motorsport is an exciting avenue for engineering students to gain practical experience in a competitive project-based team environment.

Monash Motorsport has had many successful years in the Formula SAE – the world's largest student engineering design competition. The program is a leading breeding ground for future design engineers.

The Formula SAE invites university students to design, manufacture, test and compete with a single seat race car. Cars are judged for dynamic performance including acceleration, autocross, endurance and fuel economy – and for static events such as costs, marketing and design philosophy.

Monash Motorsport is one of the top Formula SAE teams in the Asia-Pacific region, having been crowned Australasian champions seven times from 2009 to 2015. The team also regularly race internationally at the Formula Student UK, Formula Student Austria and Formula Student Germany competitions.

MONASH HUMAN POWERED VEHICLE TEAM

The Monash Human Powered Vehicle Team is one of the newest student based engineering projects at Monash University. Their dream is to break the fastest human powered vehicle world record.

The Monash mechanical engineering degree equips students with the skills required to design and build the lightweight, high-performance aerodynamic vehicles needed to make this attempt.

WHY MONASH?

REPUTATION

Monash University has a strong global reputation supported by impressive credentials. We are rated number one for engineering in Australia and are in the top one percent of universities in the world for engineering (Times Higher Education Rankings 2018).

The Faculty of Engineering is recognised as producing research that is well above world standard (Excellence in Research for Australia 2015).

WORLD-CLASS FACILITIES

Engineering is a hands-on discipline that requires the very best facilities to support your learning. Monash is proud to host a range of world-class engineering facilities.

MORE CHOICE, GREATER FLEXIBILITY

Monash offers the widest choice of engineering courses in Australia. We offer you the flexibility of the common first year – and the opportunity to broaden your career options with a double degree.

THE TOTAL EXPERIENCE

Monash Engineering is well known for its integration of practical and theoretical learning. The faculty offers a range of enrichment activities to open your eyes to a world outside the classroom. Some of these activities include the Monash Motorsport team, the Unmanned Aerial Systems team, the Nova Rova team, Monash Human Power team, Engineering Leadership Program, the Monash Industry Team Initiative and the Summer Research Program.

PROFESSIONAL RECOGNITION

The Monash engineering degree is accredited by Engineers Australia. Engineers Australia is signatory to the Washington Accord – an international agreement among bodies responsible for accrediting engineering degree programs. This means that your Monash engineering qualification will be automatically recognised in any of the signatory countries.



COURSE OVERVIEW

COURSE STRUCTURE

The first level of the course contains units common to all engineering disciplines as well as a broad range of electives. At the end of your first year, you can apply to specialise in mechanical engineering.

Mechanical engineering is structured along thematic lines, with each level building on the previous. During level two you will be introduced to the fundamentals of the discipline. Level three then provides a deeper core understanding, while level four is the gateway to your mechanical engineering career.

Monash offers a strong design theme throughout the course, culminating in level four with a capstone design project. In level four you will also undertake a research project working alongside PhD students and postdoctoral researchers – or with an industry partner.

We offer specialised electives in topics such as composite materials, micro-nano solids and fluid mechanics, advanced dynamics and robotics. As part of your undergraduate degree you may also have the opportunity to undertake units from mechanical, renewable and sustainable energy, or medical engineering specialisations of the Master of Advanced Engineering.

DOUBLE DEGREES

More and more organisations seek engineering graduates with expertise in other disciplines. They increasingly value the breadth of knowledge evident in Monash double degree graduates.

A double degree allows you to pursue a career in either area – or to take up one of the many opportunities emerging at the interface of disciplines.

Combine your mechanical engineering qualification with another bachelor's degree in:

- arts
- biomedical science
- commerce
- industrial design
- law
- science.

MEET OUR GRADUATES



TIM GOODSON
Energy Analyst, International Energy Agency

An Energy Analyst at the International Energy Agency (IEA) in Paris, Tim has joined the multinational team that produces the annual World Energy Outlook. Tim's work facilitates the global transition towards a sustainable energy future. "My role is to model future energy demand under different policy scenarios and then translate the results into a detailed analysis of global energy trends and key messages for policymakers," he explains.

Tim first pursued his passion for energy issues through volunteer work. "Not only has volunteering opened many doors in my professional life, it has opened my eyes to career options and global challenges," he shares. Tim volunteered at Pollinate Energy, a social business working to provide affordable and clean energy solutions to families in Indian slums and he also assisted in the Beyond Zero Emissions Fossil Economy Report, conducting in-depth research into current energy use profiles and policies.

"I've been lucky enough to have grown up without limits on what's possible or what you can become," he says. "The Monash Engineering Leadership Program, my volunteering experiences, university exchanges and the opportunity to mix different fields through a double degree all contributed to opening up my world."



AVON PERERA
Design Engineer, The Creature Technology Company

Monash Engineering graduate Avon Perera has entered a new world of training dragons and walking with dinosaurs. Avon completed a double degree in Mechanical Engineering and Industrial Design at Monash University and now works as a Design Engineer at The Creature Technology Company (CTC).

CTC created the full-scale naturalistic dinosaurs and dragons for Walking with Dinosaurs and "How to Train Your Dragon" Arena Spectaculars'. Avon says his double degree has allowed him to combine his artistic and technical skills and helped him land his dream job.

"The majority of my role revolves around the mechanical design of (primarily) steel components and mechanisms, so I draw a lot upon the principles taught in the mechanical engineering and CAD subjects. CAD has really helped the company push the boundaries of creature design and visualisation."

"Definitely the biggest highlight has been seeing these creatures that I've had so much time and effort invested in finally coming online and brought to life! There's absolutely nothing that can prepare you for the impact of a 12m long dragon flapping its wings and roaring at you!"



RACHEL MACE
Applications Engineer, Knorr-Bremse

Rachel is working in the truck and trailer industry at Knorr-Bremse as an Applications Engineer, specialising in electronic braking systems.

"Roughly a third of my role involves testing Kenworth and Mack trucks at the DECA track in Shepparton, in order to program them for roll stability," says Rachel. "We drive the trucks to Shepparton then take them on the skidpan at DECA using large outriggers which prevent the trucks from rolling during testing."

"In the long term I'd love to be involved in ensuring all trucks and trailers have roll stability as a minimum criterion, as the rate of truck and trailer rollovers in Australia is too high," explains Rachel.

One of Rachel's highlight during her time at university was joining the Monash FSAE team, where she went on to become Team Leader. "My favourite moment was travelling with the Monash FSAE team to Silverstone in the UK to compete internationally against over 100 teams. What's more, we placed third overall," says Rachel. "I can't imagine when I'll ever have another opportunity to travel with 30 of my closest friends and see so much in just three weeks."

NEXT STEPS

COURSE DETAILS

Location: Clayton

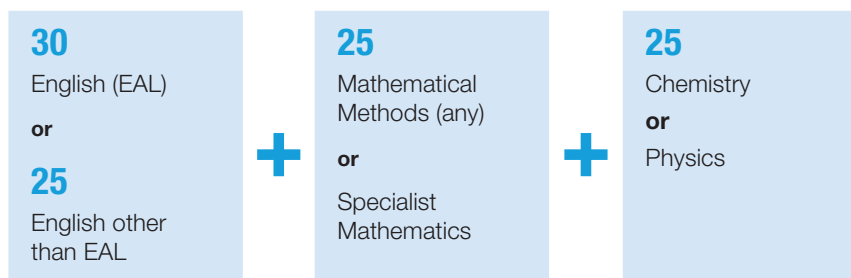
Indicative ATAR: 91.05*

Indicative IB Score: 34*

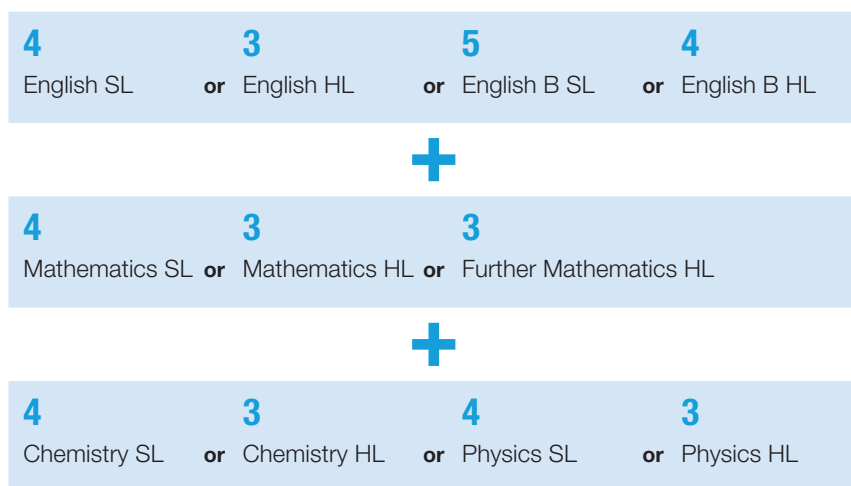
Duration: 4 years

Degree awarded: Bachelor of Mechanical Engineering (Honours)

VCE prerequisites (units 3 and 4)



International baccalaureate subject prerequisites



* The scores are to be used as a guide only, and are either lowest selection rank to which an offer was made in 2018 or an Estimate (E).

HOW TO APPLY

Domestic (Australian) and onshore international students

Apply through VTAC if you are an Australian or New Zealand citizen, an Australian permanent resident, or you are an international student studying an Australian Year 12 or IB in Australia or New Zealand, apply through the Victorian Tertiary Admission Centre (VTAC).

Visit vtac.edu.au for more information.

International students

International students should apply directly to Monash University and must have completed an equivalent qualification to the Victorian Certificate of Education (VCE) and the prerequisite subjects or equivalent.

For more information, visit monash.edu/study/international

CONNECT

Please contact the Department of Mechanical and Aerospace Engineering to find out more.

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Further information

monash.edu/engineering/mechanical

1800 MONASH (1800 666 274)

The information in this brochure was correct at the time of publication (July 2018).
Monash University reserves the right to alter this information should the need arise.
You should always check with the relevant Faculty office when considering a course.

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